5.0 APPENDICES

APPENDIX A - COMMENTS ON ANOMALIES OF GRAPHICAL DATA

Appendix B5 & B6. The initial dP data was not historized correctly, so the first couple of days of dP history do not exist in the Plant Historian.

Appendix B19. Significant increases in Chamber Power typically indicate periods where the initial inlet field was energized, although spikes also occur during periods of reduced loading on the unit.

Appendix B17. Right hand column of units is incorrect. The ug/g unit is correct, but this is not a direct percent.

Appendix B8. Opacity Graph shows two spikes in the opacity reading that were not real (1/15/2003 & 3/1/2003). These spikes were instrumentation failures and/or calibrations.

Appendix B8. Opacity graph shows spikes around 6/10/2003. These are instrument difficulties, and not representative of actual opacity.

Appendix B15. bam, ebm, etc. are Powder River Basin mine codes

Appendix B14 & 15. The "adjustment" refers to an end of the month correction based on a comparison between visual levels and bookkeeping levels.

Appendix B21. Pulse counter graph seems to indicate no pulsing after the June 12, 2003 startup until the end of June. However, the scale is so large and the pulse cycle frequency was so insignificant, that it cannot be seen as a clear increase until the next quarter. The number of pulse cycles by June 30,2003 was 284.

Appendix B2, B3 & B7. Low stack flow readings around 7/21/2003 are instrument problems and not real readings. As can be seen in B1, the plant was on-line and operating during the indicated period of no flow.

Appendix B8. Opacity spikes around 7/21/2003 and 9/23/2003 are instrument problems and not representative of actual high opacity.

Appendix B8. During the plant outage, (the period represented approximately 12/4/2003 – 12/9/2003 on the graph), the opacity is out of scale because it was removed from the plant stack and a "clear stack" calibration was performed in a clean environment. So the data from that period is not valid.

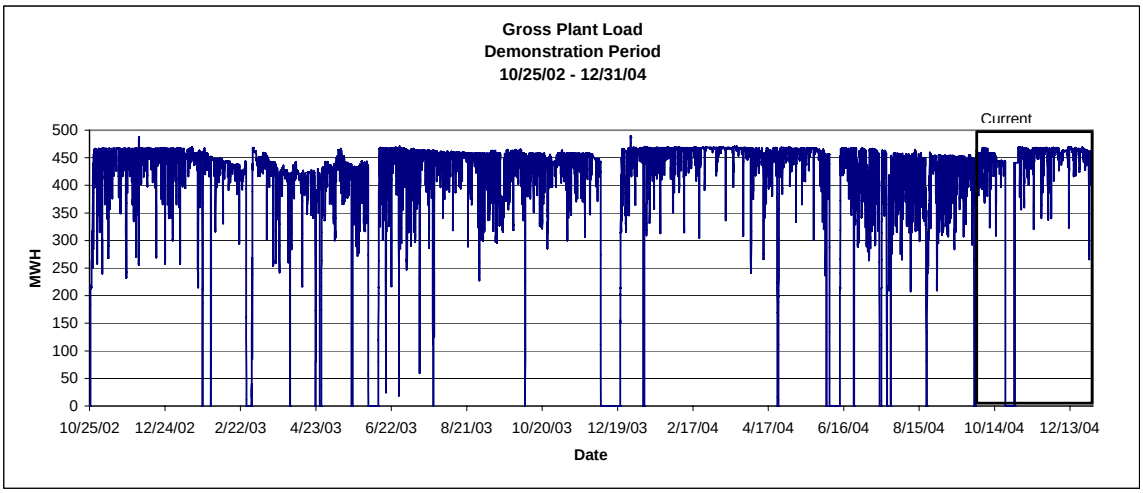
Appendix B6. There is no clear reason for the high differential pressure reading around 3/3/2003.

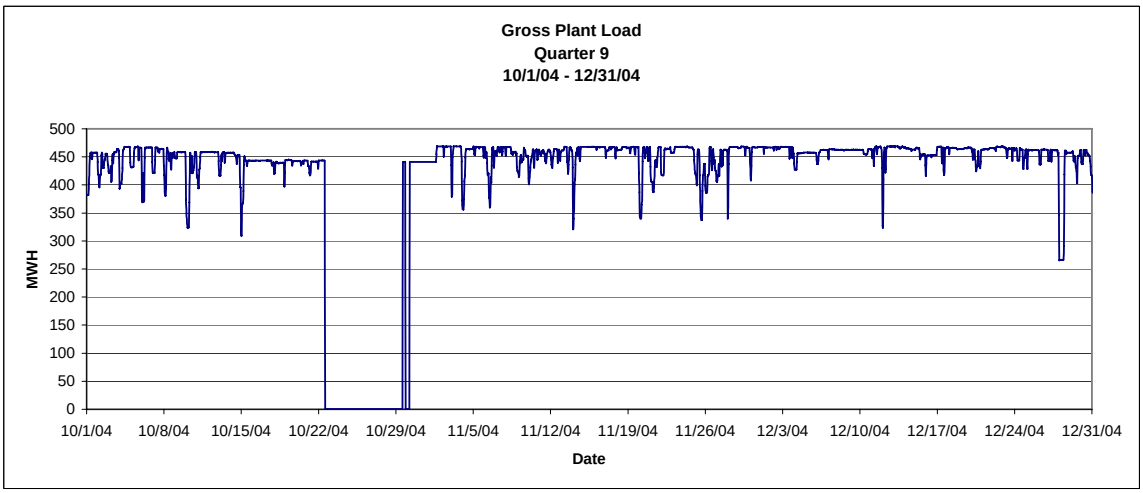
Appendix B8. The Opacity spike around 3/25/2004 was due to a calibration, and not a real opacity event. The step change in opacity can be attributed to a calibration issue and not a real opacity event.

Appendix B6. Beginning around 9/23/2004, there was a plugged sensing line for the Flange-to-Flange dP and this reading is in error.

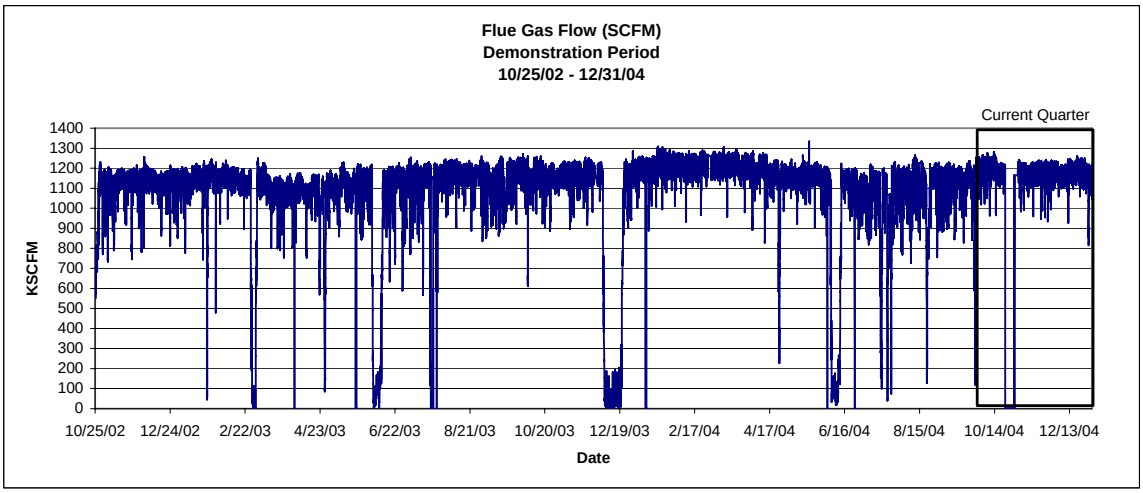
APPENDIX B – Graphical & Tabular Performance Data

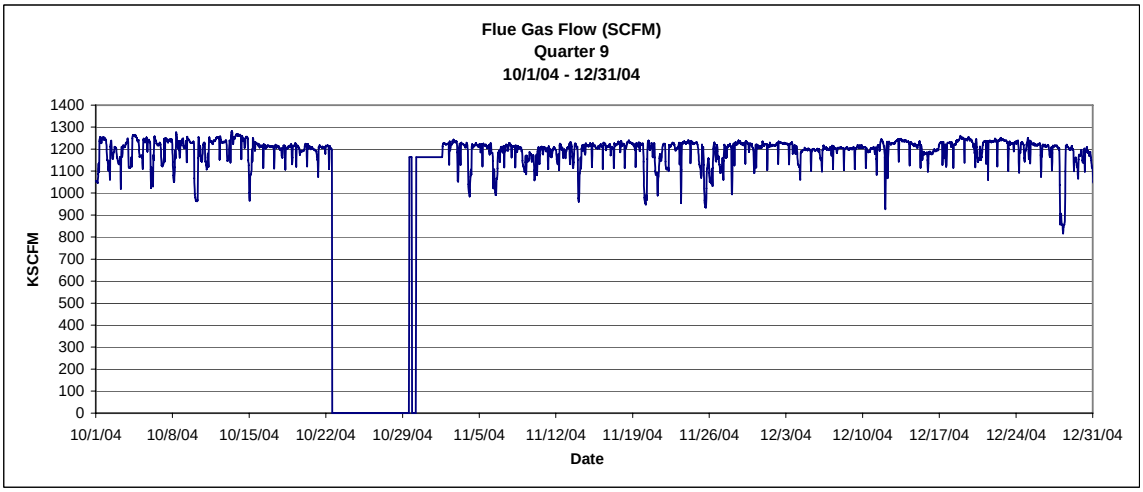
B1 Gross Plant Load



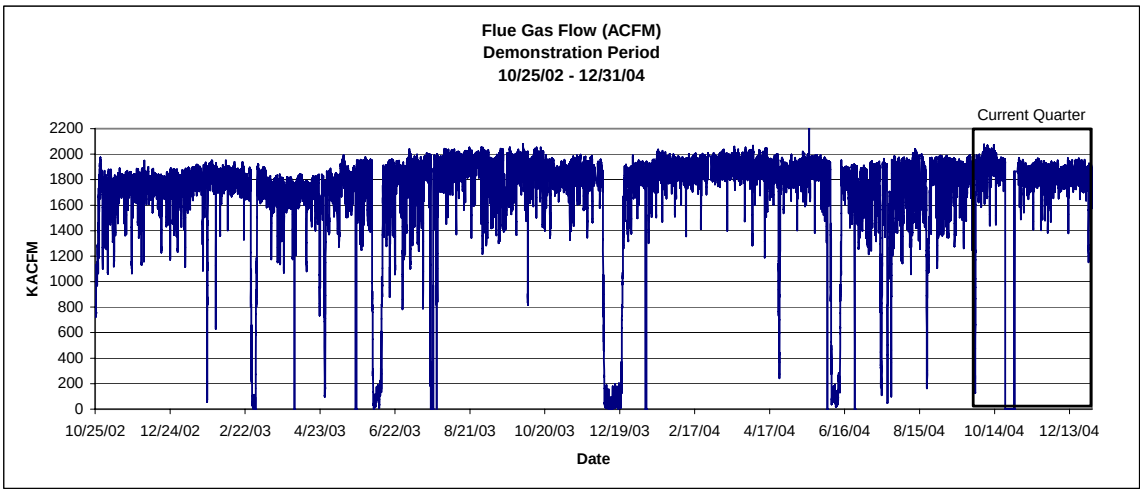


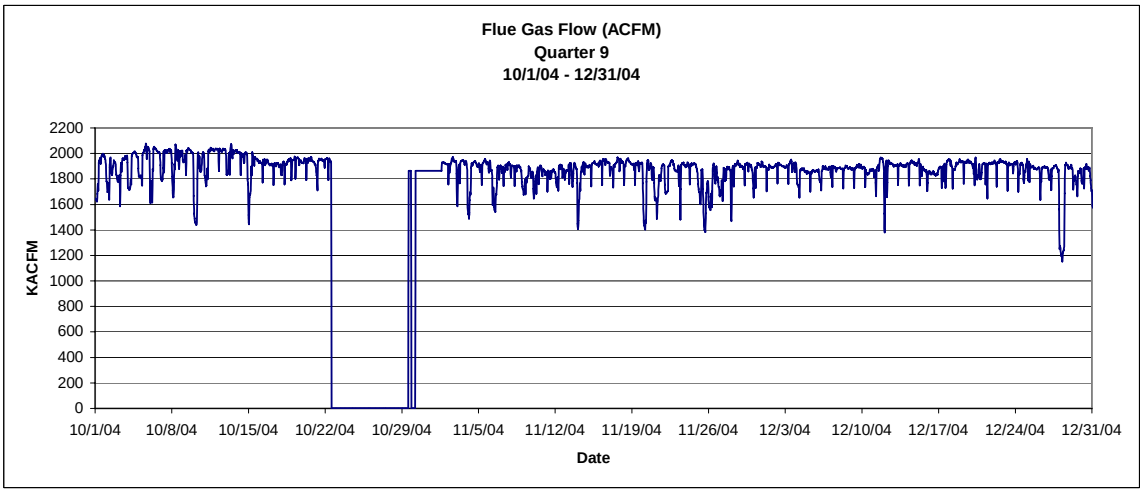
B2 Flue Gas Flow (KSCFM)



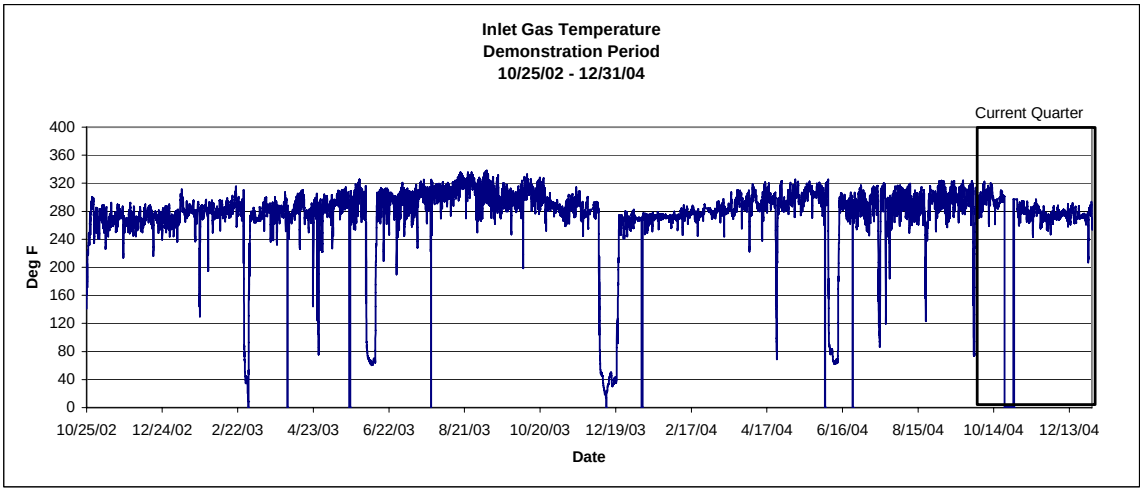


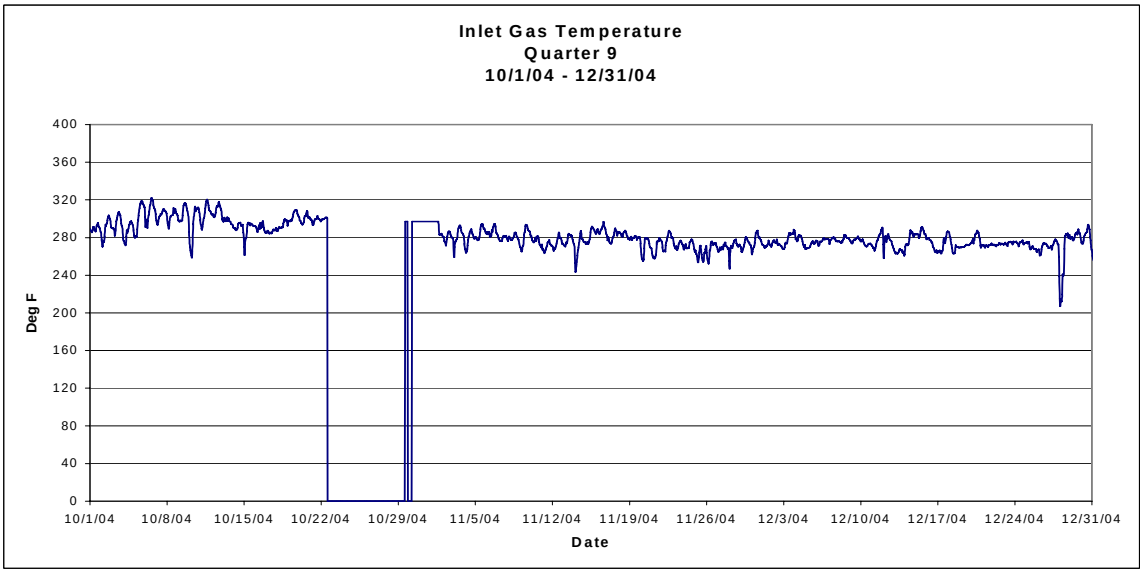
B3 Flue Gas Flow (KACFM)



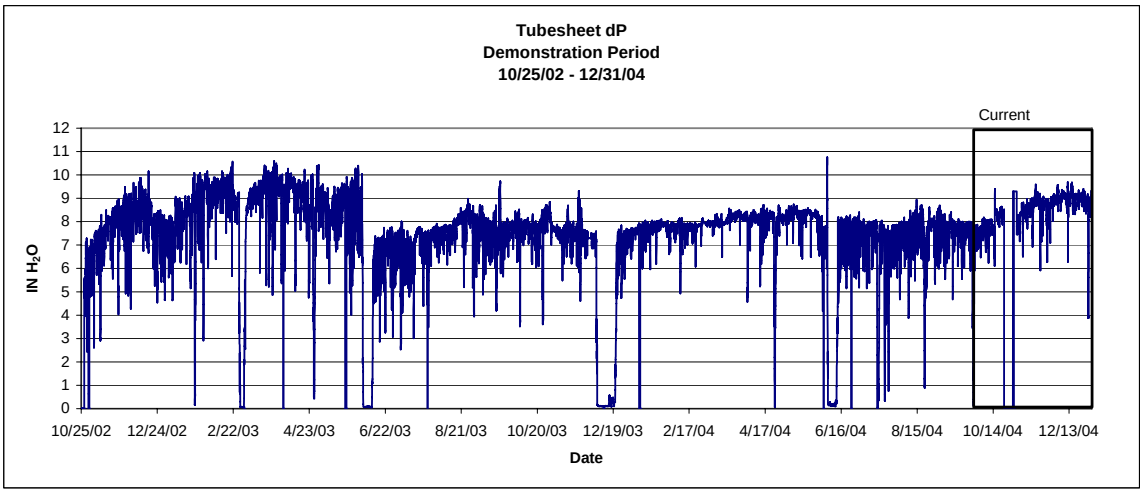


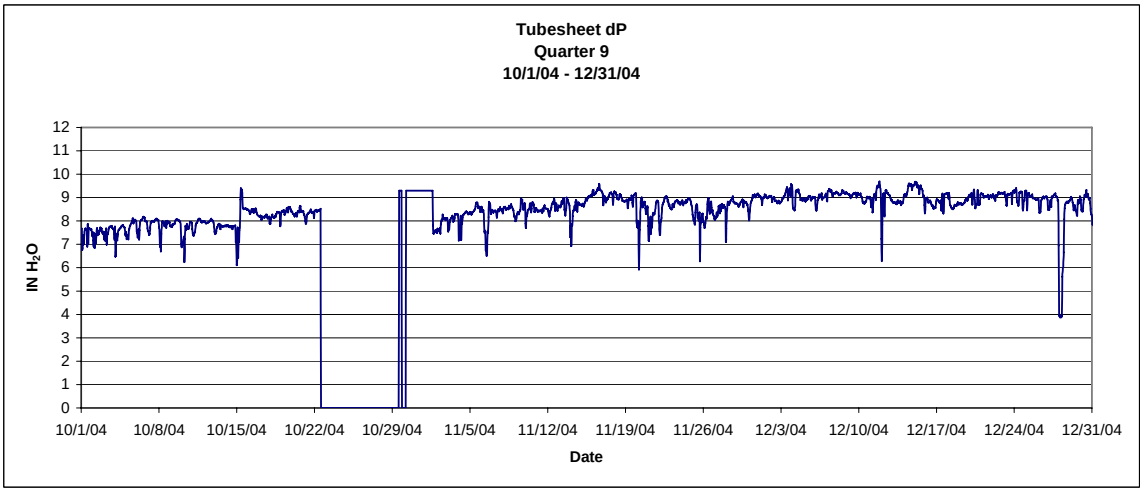
B4 Inlet Gas Temperature



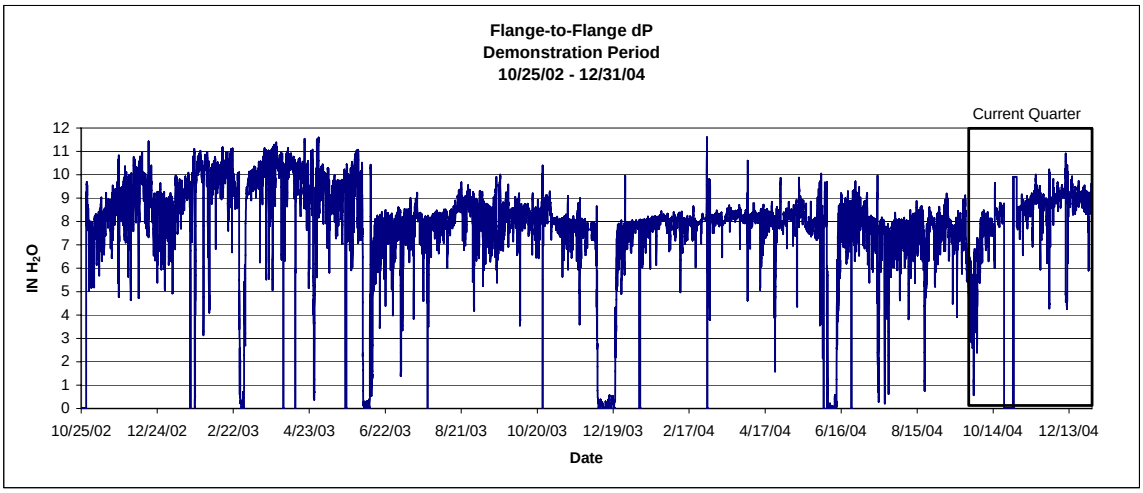


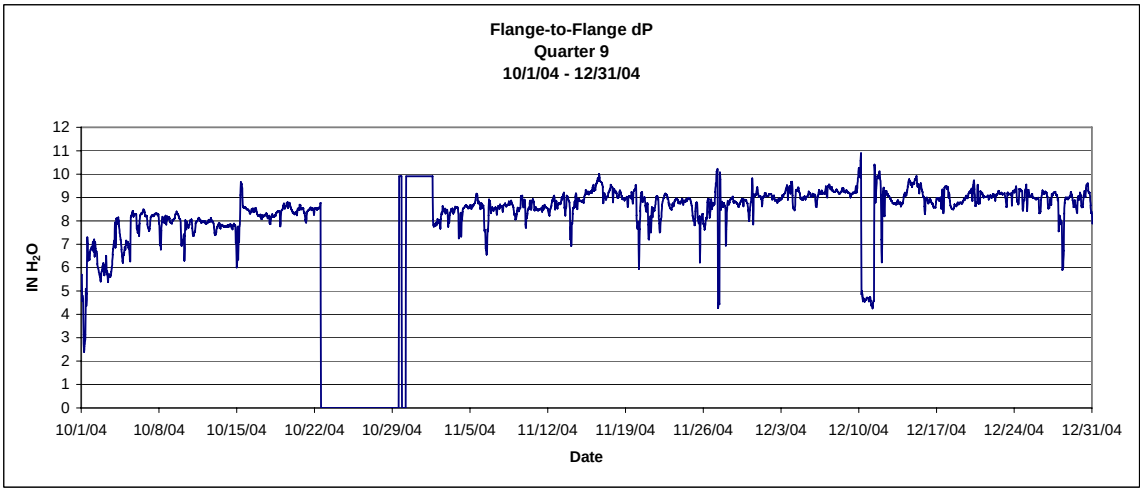
B5 Tubesheet dP



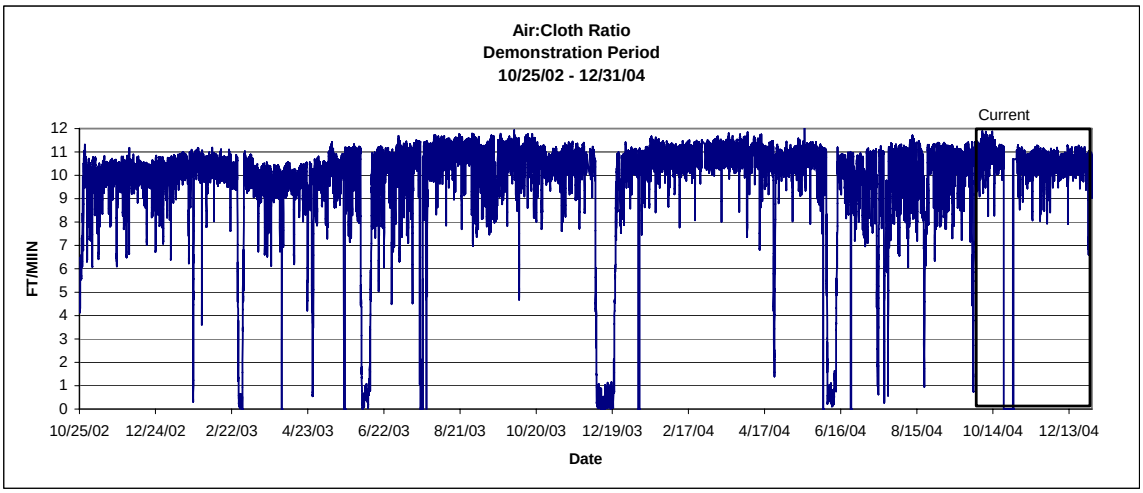


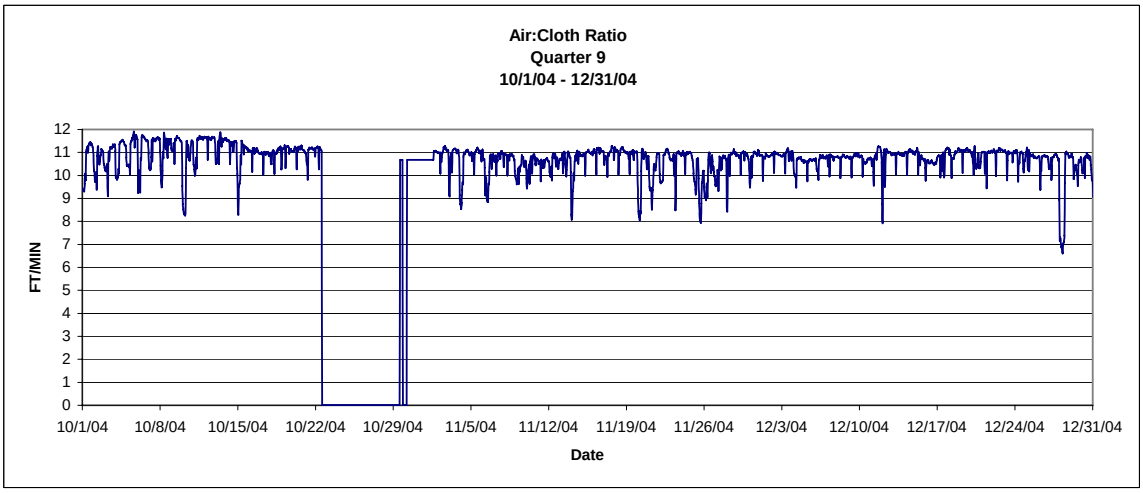
B6 Flange-to-Flange dP



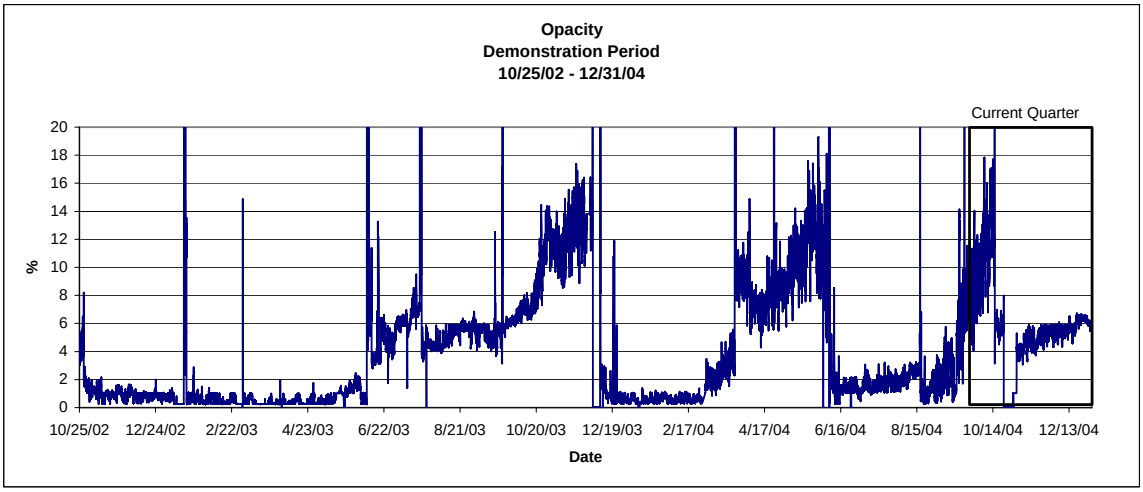


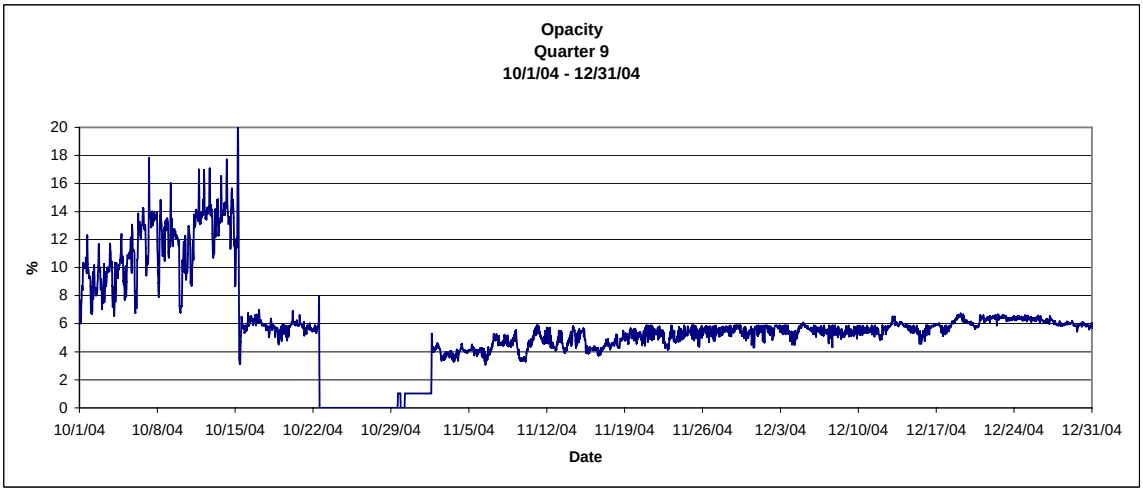
B7 Air-to-Cloth Ratio



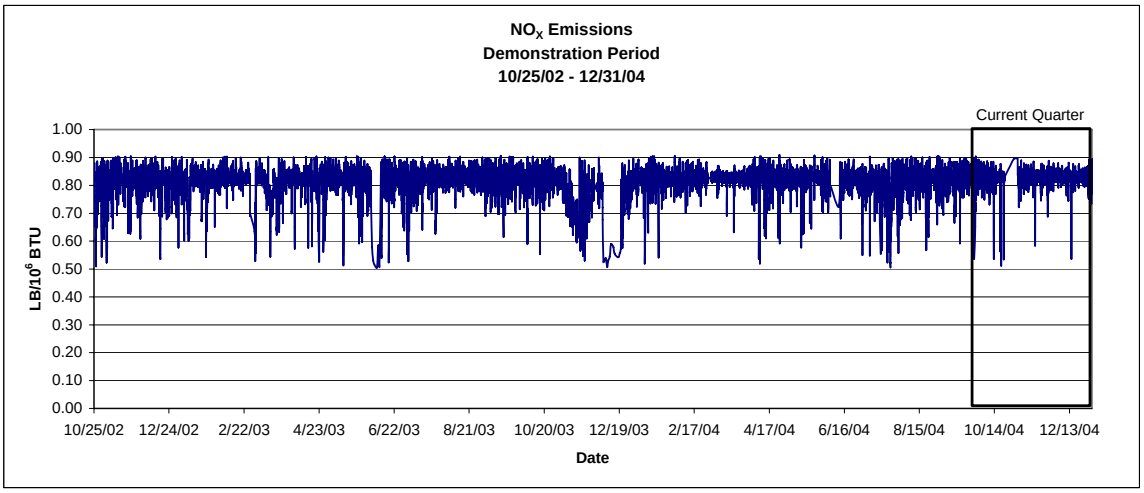


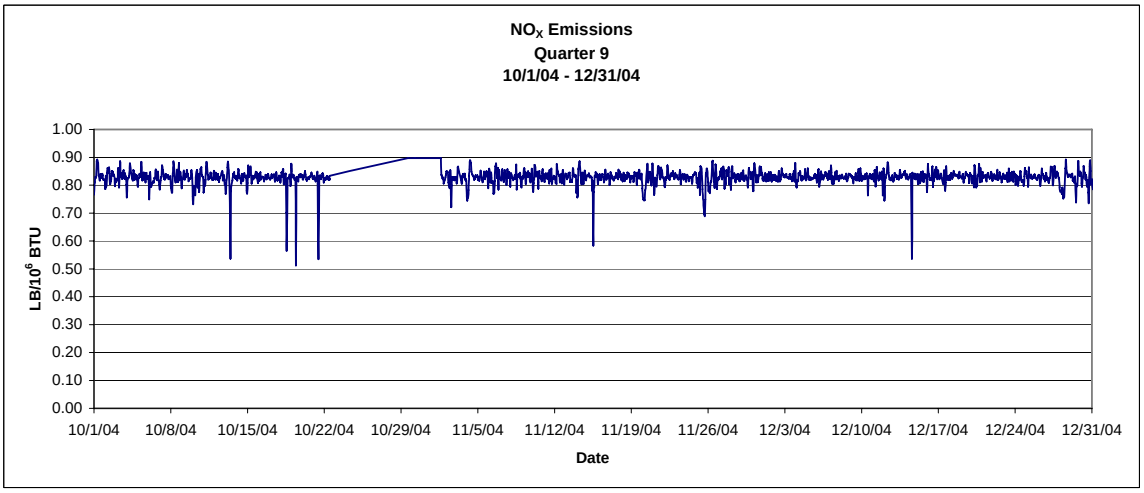
B8 Opacity


Opacity
Demonstration Period
10/25/02 - 12/31/04
Current Quarter
%
20
18
16
14
12
10
8
6
4
2
0
10/25/02
12/24/02
2/22/03
4/23/03
6/22/03
8/21/03
10/20/03
12/19/03
2/17/04
4/17/04
6/16/04
8/15/04
10/14/04
12/13/04
Date

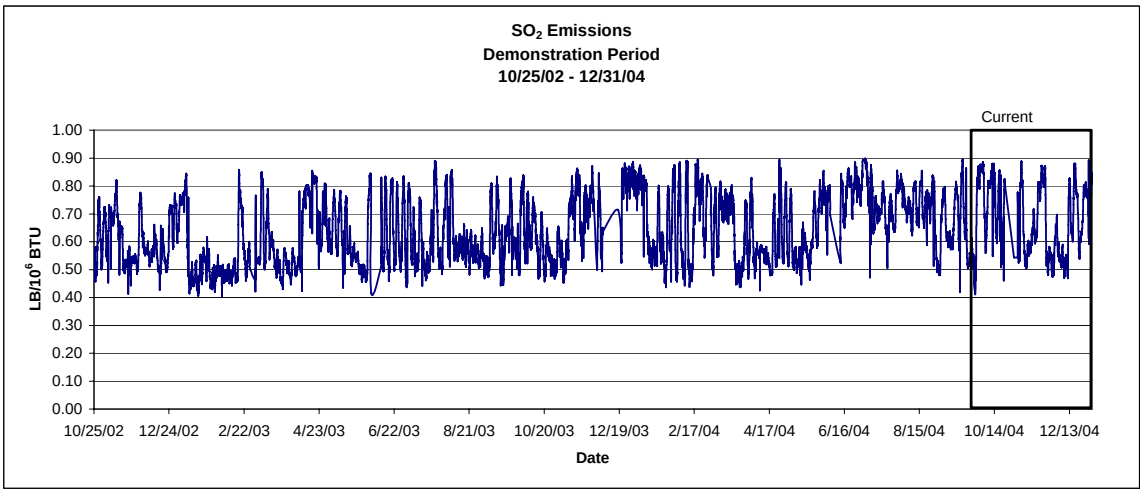

Opacity
Quarter 9
10/1/04 - 12/31/04
%
20
18
16
14
12
10
8
6
4
2
0
10/1/04
10/8/04
10/15/04
10/22/04
10/29/04
11/5/04
11/12/04
11/19/04
11/26/04
12/3/04
12/10/04
12/17/04
12/24/04
12/31/04
Date

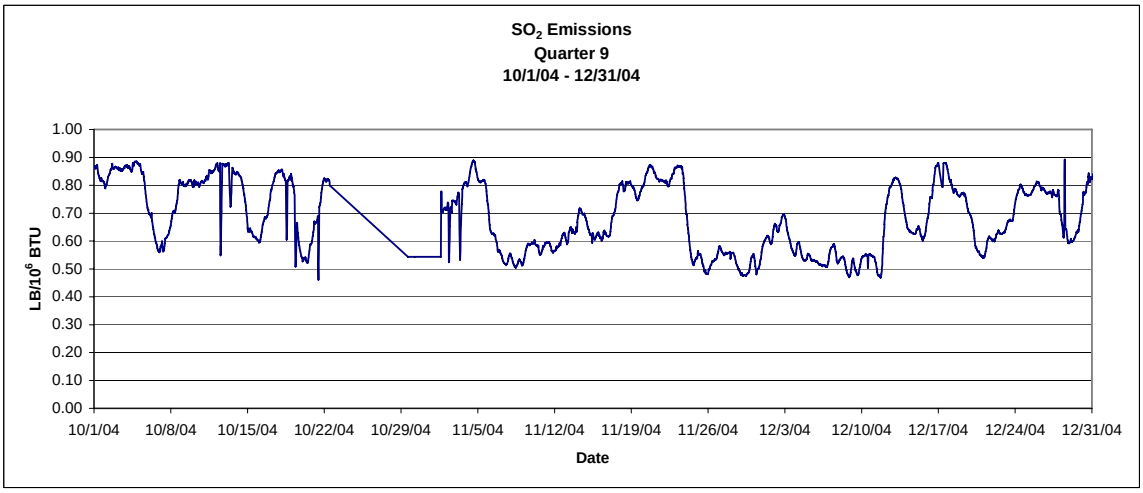
B9 NO_X Emissions



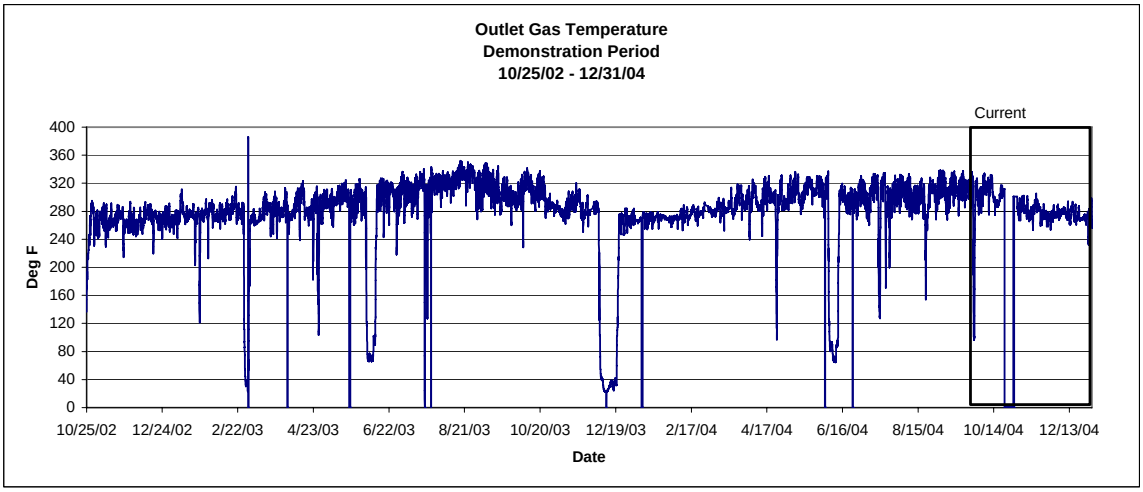


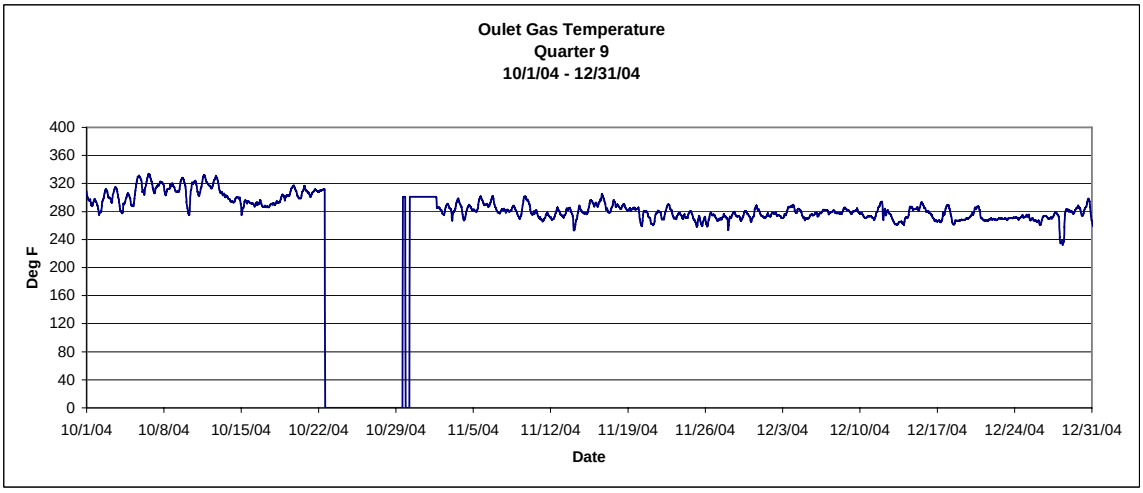
B10 SO_2 Emissions



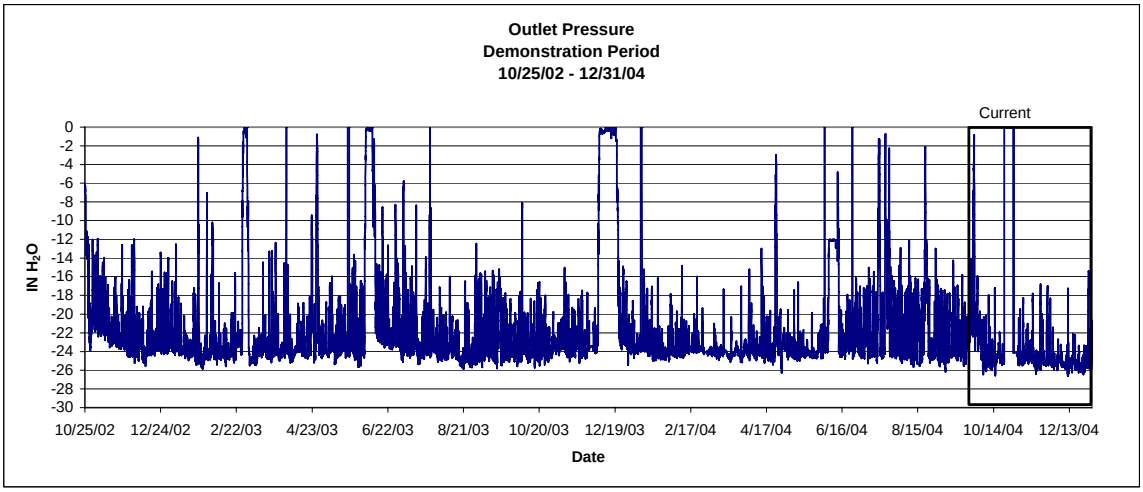


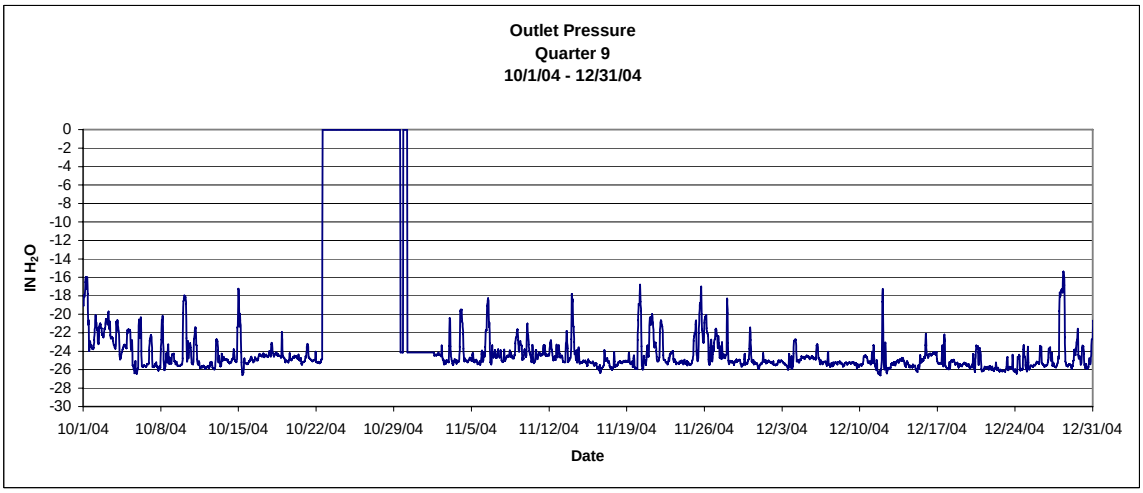
B11 Outlet Gas Temperature



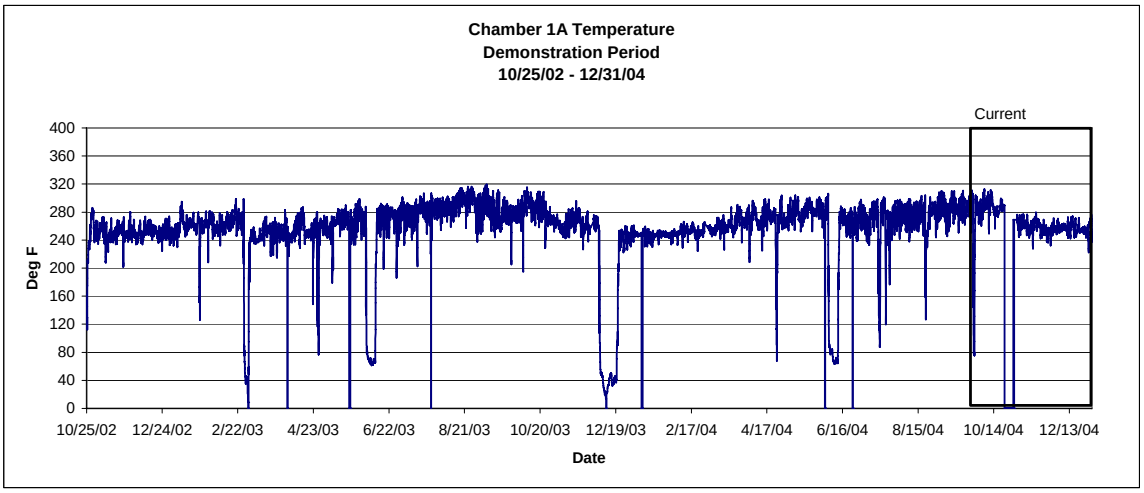


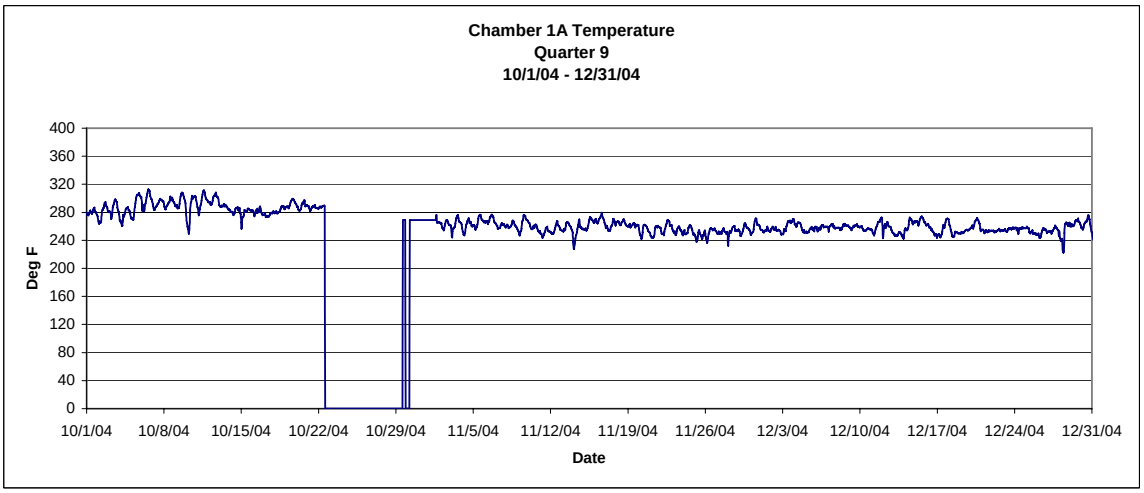
B12 Outlet Pressure

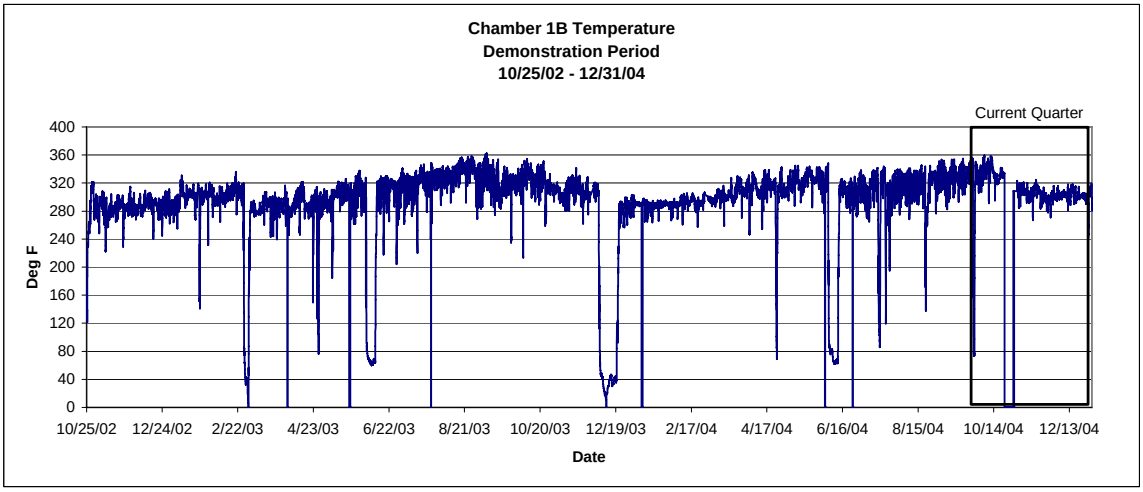


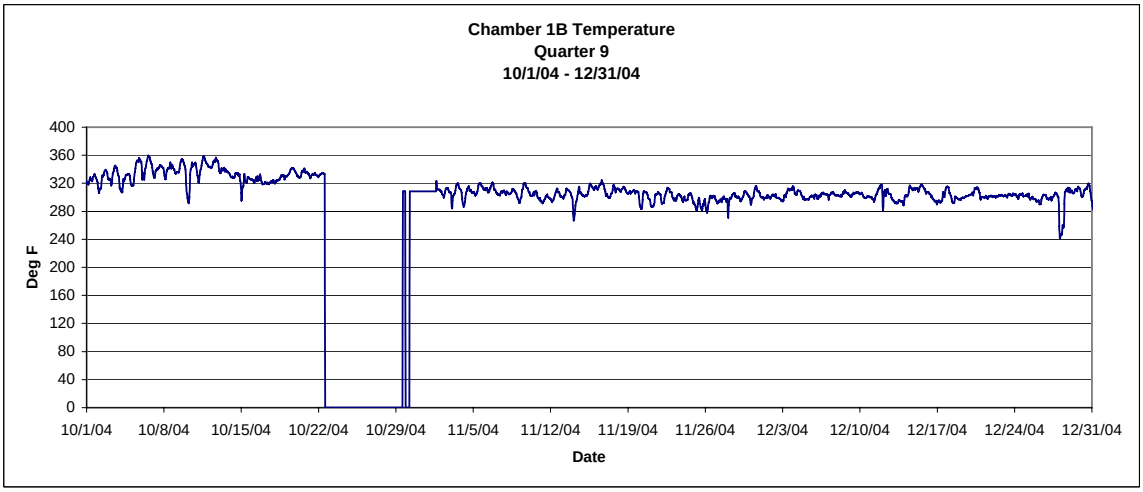


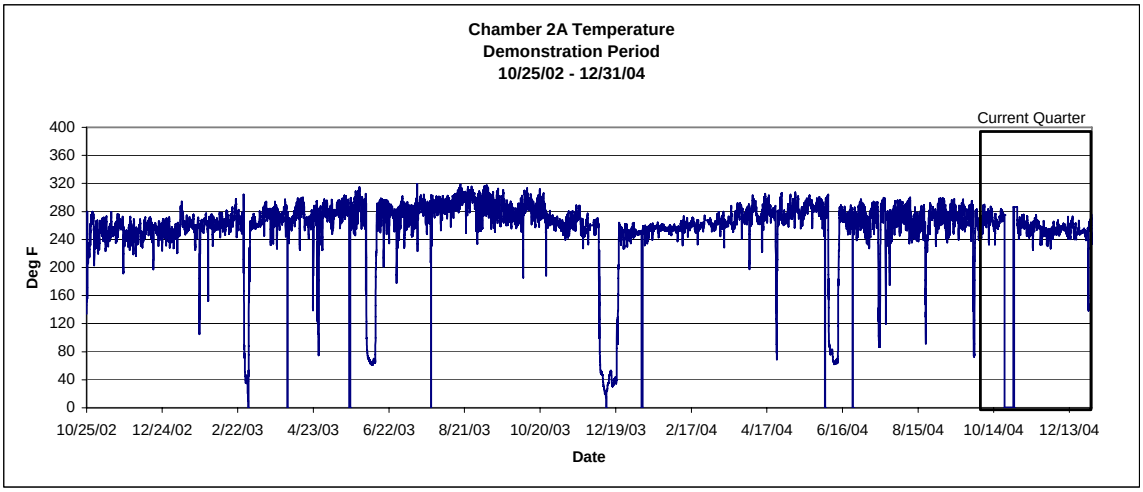
B13 Temperature per Chamber

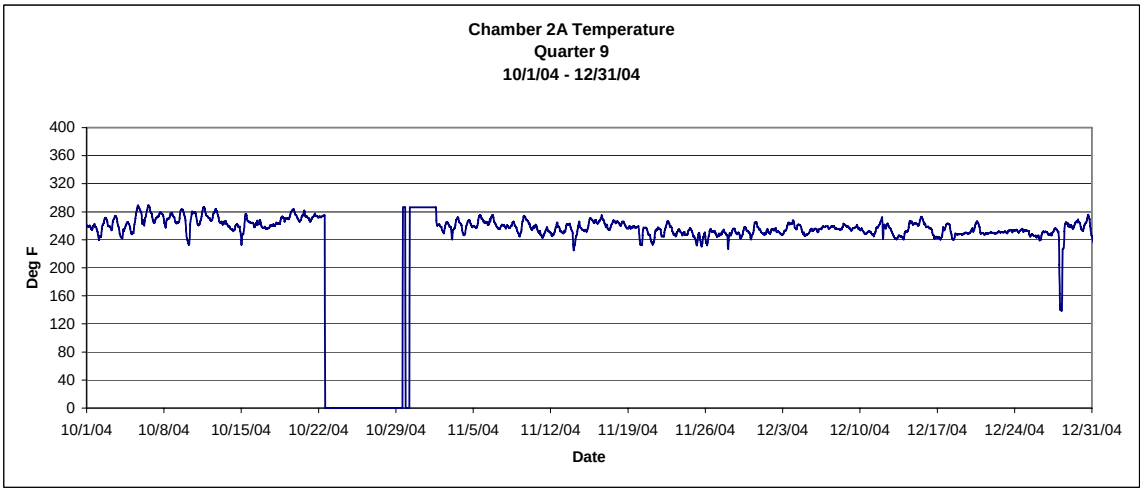


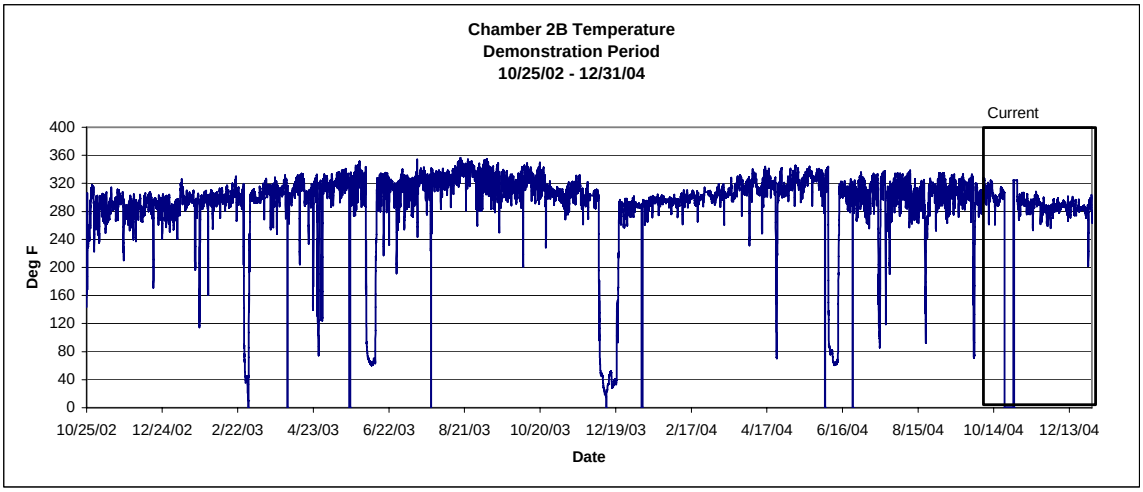


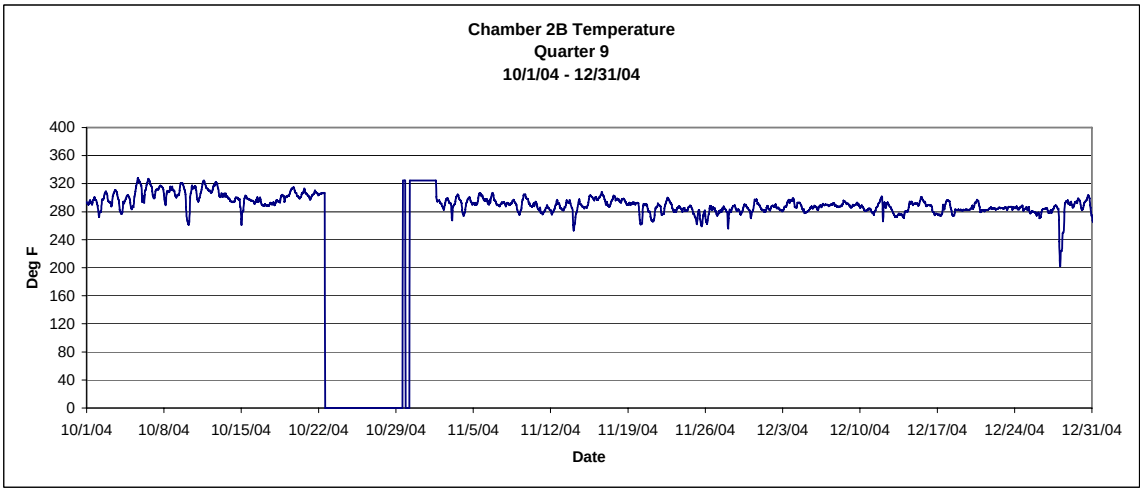

Chamber 1B Temperature
Demonstration Period
10/25/02 - 12/31/04
Current Quarter
Deg F
400
360
320
280
240
200
160
120
80
40
0
10/25/02
12/24/02
2/22/03
4/23/03
6/22/03
8/21/03
10/20/03
12/19/03
2/17/04
4/17/04
6/16/04
8/15/04
10/14/04
12/13/04
Date


Chamber 1B Temperature
Quarter 9
10/1/04 - 12/31/04
Deg F
400
360
320
280
240
200
160
120
80
40
0
10/1/04
10/8/04
10/15/04
10/22/04
10/29/04
11/5/04
11/12/04
11/19/04
11/26/04
12/3/04
12/10/04
12/17/04
12/24/04
12/31/04
Date


Chamber 2A Temperature
Demonstration Period
10/25/02 - 12/31/04
Current Quarter
Deg F
400
360
320
280
240
200
160
120
80
40
0
10/25/02
12/24/02
2/22/03
4/23/03
6/22/03
8/21/03
10/20/03
12/19/03
2/17/04
4/17/04
6/16/04
8/15/04
10/14/04
12/13/04
Date


Chamber 2A Temperature
Quarter 9
10/1/04 - 12/31/04
Deg F
400
360
320
280
240
200
160
120
80
40
0
10/1/04
10/8/04
10/15/04
10/22/04
10/29/04
11/5/04
11/12/04
11/19/04
11/26/04
12/3/04
12/10/04
12/17/04
12/24/04
12/31/04
Date


Chamber 2B Temperature
Demonstration Period
10/25/02 - 12/31/04
Current
Deg F
400
360
320
280
240
200
160
120
80
40
0
10/25/02
12/24/02
2/22/03
4/23/03
6/22/03
8/21/03
10/20/03
12/19/03
2/17/04
4/17/04
6/16/04
8/15/04
10/14/04
12/13/04
Date


Chamber 2B Temperature
Quarter 9
10/1/04 - 12/31/04
Deg F
400
360
320
280
240
200
160
120
80
40
0
10/1/04
10/8/04
10/15/04
10/22/04
10/29/04
11/5/04
11/12/04
11/19/04
11/26/04
12/3/04
12/10/04
12/17/04
12/24/04
12/31/04
Date

B14 Fuel Burn Record

BIG STONE PLANT
FUEL BURN RECORD - page 1
Oct-02

DATE	Coal (Tons)	P. Coke (Tons)	TDF (Tons)	Waste Seeds (Tons)	Toner (Tons)	Gran. Insul. (Tons)	Canvas Belting (Tons)	Plastic Chips (Tons)
1-Oct-02	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
2-Oct-02	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
3-Oct-02	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
4-Oct-02	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
5-Oct-02	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
6-Oct-02	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
7-Oct-02	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
8-Oct-02	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
9-Oct-02	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
10-Oct-02	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
11-Oct-02	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
12-Oct-02	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
13-Oct-02	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
14-Oct-02	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
15-Oct-02	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
16-Oct-02	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
17-Oct-02	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
18-Oct-02	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
19-Oct-02	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
20-Oct-02	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
21-Oct-02	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
22-Oct-02	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
23-Oct-02	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
24-Oct-02	24.30	0.00	0.00	0.00	0.00	0.00	0.00	0.00
25-Oct-02	1,245.30	0.00	0.00	0.00	0.00	0.00	0.00	0.00
26-Oct-02	3,534.20	0.00	0.00	0.00	0.00	0.00	0.00	0.00
27-Oct-02	5,058.80	0.00	0.00	0.00	0.00	0.00	0.00	0.00
28-Oct-02	5,969.60	0.00	0.00	0.00	0.00	0.00	0.00	0.00
29-Oct-02	6,442.60	0.00	0.00	0.00	0.00	0.00	0.00	0.00
30-Oct-02	6,363.10	0.00	0.00	0.00	0.00	0.00	0.00	0.00
31-Oct-02	5,619.90	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Adjustment	0.00							
Total Burned	34,257.80	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Total Delivered	56,477.36	0.00	22.39	189.33	0.00	0.00	0.00	0.00
HHV	8538	0	15000	7187	0	0	0	0
% Ash	4.41%	0.00%	7.04%	1.10%	0.00%	0.00%	0.00%	0.00%
Tons Ash	1,511.61	0.00	51.48	12.52	0.00	0.00	0.00	0.00

BIG STONE PLANT
FUEL BURN RECORD - page 1
Nov-02

DATE	Coal	P. Coke	TDF	Waste Seeds	Toner	Gran. Insul.	Canvas Belting	Plastic Chips
	(Tons)	(Tons)	(Tons)	(Tons)	(Tons)	(Tons)	(Tons)	(Tons)
1-Nov-02	5,987.98	0.00	22.39	189.33	0.00	0.00	0.00	0.00
2-Nov-02	6,001.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
3-Nov-02	5,640.70	0.00	0.00	0.00	0.00	0.00	0.00	0.00
4-Nov-02	4,601.40	0.00	90.01	979.79	0.00	0.00	0.00	0.00
5-Nov-02	5,871.32	0.00	22.61	36.17	0.00	0.00	0.00	0.00
6-Nov-02	6,181.69	0.00	45.36	47.65	0.00	0.00	0.00	0.00
7-Nov-02	6,062.10	0.00	0.00	0.00	0.00	0.00	0.00	0.00
8-Nov-02	5,518.75	0.00	249.68	98.17	0.00	0.00	0.00	0.00
9-Nov-02	5,418.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
10-Nov-02	6,080.30	0.00	0.00	0.00	0.00	0.00	0.00	0.00
11-Nov-02	6,315.50	0.00	0.00	0.00	0.00	0.00	0.00	0.00
12-Nov-02	6,169.84	0.00	45.18	24.18	0.00	0.00	0.00	0.00
13-Nov-02	6,139.55	0.00	91.71	23.04	0.00	0.00	0.00	0.00
14-Nov-02	6,305.74	0.00	117.44	48.82	0.00	0.00	0.00	0.00
15-Nov-02	6,202.35	0.00	46.40	84.85	0.00	0.00	0.00	0.00
16-Nov-02	6,510.70	0.00	0.00	0.00	0.00	0.00	0.00	0.00
17-Nov-02	6,185.30	0.00	0.00	0.00	0.00	0.00	0.00	0.00
18-Nov-02	5,796.69	0.00	43.73	160.38	0.00	0.00	0.00	0.00
19-Nov-02	6,013.24	0.00	22.87	194.89	0.00	0.00	0.00	0.00
20-Nov-02	6,289.60	0.00	0.00	0.00	0.00	0.00	0.00	0.00
21-Nov-02	6,364.60	0.00	0.00	0.00	0.00	0.00	0.00	0.00
22-Nov-02	6,037.07	0.00	139.47	179.66	0.00	0.00	0.00	0.00
23-Nov-02	4,780.70	0.00	0.00	0.00	0.00	0.00	0.00	0.00
24-Nov-02	6,275.70	0.00	0.00	0.00	0.00	0.00	0.00	0.00
25-Nov-02	6,341.81	0.00	22.79	0.00	26.60	0.00	0.00	0.00
26-Nov-02	6,248.70	0.00	0.00	0.00	0.00	0.00	0.00	0.00
27-Nov-02	6,151.53	0.00	0.00	78.47	0.00	0.00	0.00	0.00
28-Nov-02	5,913.10	0.00	0.00	0.00	0.00	0.00	0.00	0.00
29-Nov-02	5,651.60	0.00	45.50	0.00	0.00	0.00	0.00	0.00
30-Nov-02	6,338.20	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Adjustment	5,000.00							
Total Burned	184,394.76	0.00	1,005.14	2,145.40	26.60	0.00	0.00	0.00
Total Delivered	193,968.54	0.00	982.75	1,956.07	26.60	0.00	0.00	0.00
HHV	8534	0	15000	7187	16932	0		
% Ash	4.73%	0.00%	7.04%	1.10%	0.00%	0.00%		
Tons Ash	8,715.21	0.00	70.76	23.60	0.00	0.00	0.00	0.00

BIG STONE PLANT
FUEL BURN RECORD - page 1
Dec-02

DATE	Coal (Tons)	P. Coke (Tons)	TDF (Tons)	Waste Seeds (Tons)	Toner (Tons)	Gran. Insul. (Tons)	Canvas Belting (Tons)	Plastic Chips (Tons)
1-Dec-02	5,707.30	0.00	0.00	0.00	0.00	0.00	0.00	0.00
2-Dec-02	6,179.46	0.00	46.14	0.00	0.00	0.00	0.00	0.00
3-Dec-02	5,916.85	0.00	43.80	97.85	0.00	0.00	0.00	0.00
4-Dec-02	6,348.34	0.00	22.26	0.00	0.00	0.00	0.00	0.00
5-Dec-02	6,340.69	0.00	20.11	0.00	0.00	0.00	0.00	0.00
6-Dec-02	6,484.34	0.00	46.06	0.00	0.00	0.00	0.00	0.00
7-Dec-02	6,378.70	0.00	0.00	0.00	0.00	0.00	0.00	0.00
8-Dec-02	6,530.40	0.00	0.00	0.00	0.00	0.00	0.00	0.00
9-Dec-02	6,317.27	0.00	43.53	0.00	0.00	0.00	0.00	0.00
10-Dec-02	6,267.33	0.00	45.67	26.00	0.00	0.00	0.00	0.00
11-Dec-02	6,394.00	0.00	94.30	0.00	0.00	0.00	0.00	0.00
12-Dec-02	6,523.60	0.00	0.00	0.00	0.00	0.00	0.00	0.00
13-Dec-02	6,257.51	0.00	93.99	0.00	0.00	0.00	0.00	0.00
14-Dec-02	6,373.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
15-Dec-02	6,351.50	0.00	0.00	0.00	0.00	0.00	0.00	0.00
16-Dec-02	6,274.49	0.00	70.37	17.64	0.00	0.00	0.00	0.00
17-Dec-02	5,785.53	0.00	45.77	0.00	0.00	0.00	0.00	0.00
18-Dec-02	6,368.68	0.00	47.44	47.88	0.00	0.00	0.00	0.00
19-Dec-02	6,374.26	0.00	24.14	48.00	0.00	0.00	0.00	0.00
20-Dec-02	6,453.80	0.00	0.00	0.00	0.00	0.00	0.00	0.00
21-Dec-02	6,289.90	0.00	0.00	0.00	0.00	0.00	0.00	0.00
22-Dec-02	6,072.40	0.00	0.00	0.00	0.00	0.00	0.00	0.00
23-Dec-02	6,171.47	0.00	64.61	71.82	0.00	0.00	0.00	0.00
24-Dec-02	6,183.60	0.00	0.00	0.00	0.00	0.00	0.00	0.00
25-Dec-02	6,604.60	0.00	0.00	0.00	0.00	0.00	0.00	0.00
26-Dec-02	6,236.90	0.00	0.00	0.00	0.00	0.00	0.00	0.00
27-Dec-02	6,056.94	0.00	44.89	25.47	0.00	0.00	0.00	0.00
28-Dec-02	6,240.40	0.00	0.00	0.00	0.00	0.00	0.00	0.00
29-Dec-02	6,168.90	0.00	0.00	0.00	0.00	0.00	0.00	0.00
30-Dec-02	5,950.50	0.00	0.00	0.00	0.00	0.00	0.00	0.00
31-Dec-02	5,951.26	0.00	116.11	75.03	0.00	0.00	0.00	0.00
Adjustment	3,000.00							
Total Burned	196,553.92	0.00	869.19	409.69	0.00	0.00	0.00	0.00
Total Delivered	195,368.84		869.19	409.69	0.00			0.00
HHV	8533		15000	7187	0	0		
% Ash	4.71%		7.04%	1.10%	0.00%	0.00%		
Tons Ash	9,254.39	0.00	70.76	23.60	0.00	0.00	0.00	0.00

BIG STONE PLANT
FUEL BURN RECORD - page 1
Jan-03

DATE	Coal	P. Coke	TDF	Waste Seeds	Toner	Gran. Insul.	Canvas Belting	Plastic Chips
	(Tons)	(Tons)	(Tons)	(Tons)	(Tons)	(Tons)	(Tons)	(Tons)
1-Jan-03	6,184.60	0.00	0.00	0.00	0.00	0.00	0.00	0.00
2-Jan-03	6,223.02	0.00	22.37	62.31	0.00	0.00	0.00	0.00
3-Jan-03	6,319.77	0.00	45.77	148.16	0.00	0.00	0.00	0.00
4-Jan-03	6,287.80	0.00	0.00	0.00	0.00	0.00	0.00	0.00
5-Jan-03	6,049.40	0.00	0.00	0.00	0.00	0.00	0.00	0.00
6-Jan-03	5,943.97	0.00	47.26	431.57	0.00	0.00	0.00	0.00
7-Jan-03	5,505.74	0.00	48.59	707.47	0.00	0.00	0.00	0.00
8-Jan-03	5,576.26	0.00	0.00	685.74	0.00	0.00	0.00	0.00
9-Jan-03	5,577.80	0.00	0.00	600.00	0.00	0.00	0.00	0.00
10-Jan-03	6,179.08	0.00	113.66	123.16	0.00	0.00	0.00	0.00
11-Jan-03	6,298.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
12-Jan-03	6,378.60	0.00	0.00	0.00	0.00	0.00	0.00	0.00
13-Jan-03	6,490.30	0.00	0.00	0.00	0.00	0.00	0.00	0.00
14-Jan-03	5,816.07	0.00	85.58	649.45	0.00	0.00	0.00	0.00
15-Jan-03	5,903.21	0.00	22.25	501.34	0.00	0.00	0.00	0.00
16-Jan-03	5,714.59	0.00	22.39	607.02	0.00	0.00	0.00	0.00
17-Jan-03	5,764.70	0.00	21.32	650.88	0.00	0.00	0.00	0.00
18-Jan-03	6,306.50	0.00	0.00	0.00	0.00	0.00	0.00	0.00
19-Jan-03	4,924.90	0.00	0.00	0.00	0.00	0.00	0.00	0.00
20-Jan-03	5,896.70	0.00	89.30	430.20	0.00	0.00	0.00	0.00
21-Jan-03	6,340.98	0.00	0.00	76.42	0.00	0.00	0.00	0.00
22-Jan-03	3,694.64	0.00	85.16	0.00	0.00	0.00	0.00	0.00
23-Jan-03	5,248.81	0.00	0.00	267.79	0.00	0.00	0.00	0.00
24-Jan-03	6,305.73	0.00	22.79	258.18	0.00	0.00	0.00	0.00
25-Jan-03	6,292.92	0.00	0.00	258.18	0.00	0.00	0.00	0.00
26-Jan-03	6,222.60	0.00	0.00	258.20	0.00	0.00	0.00	0.00
27-Jan-03	5,989.95	0.00	0.00	269.15	0.00	0.00	0.00	0.00
28-Jan-03	5,962.19	0.00	66.12	211.39	0.00	0.00	0.00	0.00
29-Jan-03	5,537.96	0.00	45.82	293.22	0.00	0.00	0.00	0.00
30-Jan-03	6,049.60	0.00	60.00	200.00	0.00	0.00	0.00	0.00
31-Jan-03	5,930.53	0.00	77.47	220.00	0.00	0.00	0.00	0.00
Adjustment	3,500.00							
Total Burned	186,416.92	0.00	875.85	7,909.83	0.00	0.00	0.00	0.00
Total Delivered	177,149.11	0.00	875.85	8,352.78	0.00	0.00	0.00	0.00
HHV	8595	0	15000	9000	0	0	0	0
% Ash	4.49%	0.00	7.04%	4.00%	0.00%	0.00%	0.00%	0.00%
Tons Ash	8,377.48	0.00	61.66	316.39	0.00	0.00	0.00	0.00

BIG STONE PLANT
FUEL BURN RECORD - page 1
Feb-03

DATE	Coal	P. Coke	TDF	Waste Seeds	Toner	Gran. Insul.	Canvas Belting	Plastic Chips
	(Tons)	(Tons)	(Tons)	(Tons)	(Tons)	(Tons)	(Tons)	(Tons)
1-Feb-03	5,984.90	0.00	0.00	220.00	0.00	0.00	0.00	0.00
2-Feb-03	5,587.95	0.00	0.00	222.95	0.00	0.00	0.00	0.00
3-Feb-03	6,017.17	0.00	45.99	159.24	0.00	0.00	0.00	0.00
4-Feb-03	5,920.68	0.00	45.07	417.35	0.00	0.00	0.00	0.00
5-Feb-03	6,006.06	0.00	0.00	261.54	0.00	0.00	0.00	0.00
6-Feb-03	6,188.40	0.00	0.00	260.00	0.00	0.00	0.00	0.00
7-Feb-03	6,038.76	0.00	85.34	317.00	0.00	0.00	0.00	0.00
8-Feb-03	5,878.50	0.00	0.00	317.00	0.00	0.00	0.00	0.00
9-Feb-03	6,067.20	0.00	0.00	315.00	0.00	0.00	0.00	0.00
10-Feb-03	6,066.62	0.00	21.19	288.99	0.00	0.00	0.00	0.00
11-Feb-03	6,050.17	0.00	0.00	186.63	0.00	0.00	0.00	0.00
12-Feb-03	5,829.92	0.00	43.13	377.75	0.00	0.00	0.00	0.00
13-Feb-03	5,933.10	0.00	0.00	300.00	0.00	0.00	0.00	0.00
14-Feb-03	5,666.96	0.00	113.84	465.00	0.00	0.00	0.00	0.00
15-Feb-03	5,849.10	0.00	0.00	465.00	0.00	0.00	0.00	0.00
16-Feb-03	5,875.29	0.00	0.00	465.11	0.00	0.00	0.00	0.00
17-Feb-03	6,093.09	0.00	0.00	235.81	0.00	0.00	0.00	0.00
18-Feb-03	5,753.45	0.00	43.27	568.28	0.00	0.00	0.00	0.00
19-Feb-03	5,749.92	0.00	90.18	450.00	0.00	0.00	0.00	0.00
20-Feb-03	5,925.30	0.00	25.00	475.00	0.00	0.00	0.00	0.00
21-Feb-03	5,237.62	0.00	91.58	847.00	0.00	0.00	0.00	0.00
22-Feb-03	5,307.10	0.00	0.00	847.00	0.00	0.00	0.00	0.00
23-Feb-03	5,211.31	0.00	0.00	849.29	0.00	0.00	0.00	0.00
24-Feb-03	6,015.68	0.00	45.43	72.19	0.00	0.00	0.00	0.00
25-Feb-03	6,154.61	0.00	86.29	1.60	0.00	0.00	0.00	0.00
26-Feb-03	4,497.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
27-Feb-03	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
28-Feb-03	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Adjustment	3,500.00							
Total Burned	154,405.86	0.00	736.31	9,384.73	0.00	0.00	0.00	0.00
Total Delivered	158,173.51	0.00	736.31	8,960.31	0.00	0.00	0.00	0.00
HHV	8551		15000	7187	0	0	0	0
% Ash	4.58%		7.05%	1.10%	0.00%	0.00%	0.00%	0.00%
Tons Ash	7,074.24	0.00	51.91	103.23	0.00	0.00	0.00	0.00

BIG STONE PLANT
FUEL BURN RECORD - page 1
Mar-03

DATE	Coal	P. Coke	TDF	Waste Seeds	Toner	Gran. Insul.	Canvas Belting	Plastic Chips
	(Tons)	(Tons)	(Tons)	(Tons)	(Tons)	(Tons)	(Tons)	(Tons)
1-Mar-03	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
2-Mar-03	127.60	0.00	0.00	0.00	0.00	0.00	0.00	0.00
3-Mar-03	3,960.94	0.00	0.00	66.66	0.00	0.00	0.00	0.00
4-Mar-03	6,652.70	0.00	0.00	0.00	0.00	0.00	0.00	0.00
5-Mar-03	6,493.70	0.00	0.00	0.00	0.00	0.00	0.00	0.00
6-Mar-03	6,344.91	0.00	22.49	0.00	0.00	0.00	0.00	0.00
7-Mar-03	6,362.77	0.00	22.40	24.93	0.00	0.00	0.00	0.00
8-Mar-03	6,451.40	0.00	0.00	0.00	0.00	0.00	0.00	0.00
9-Mar-03	6,504.70	0.00	0.00	0.00	0.00	0.00	0.00	0.00
10-Mar-03	6,307.69	0.00	64.94	71.57	0.00	0.00	0.00	0.00
11-Mar-03	6,365.86	0.00	0.00	24.04	0.00	0.00	0.00	0.00
12-Mar-03	6,457.50	0.00	45.90	0.00	0.00	0.00	0.00	0.00
13-Mar-03	6,327.30	0.00	21.64	24.46	0.00	0.00	0.00	0.00
14-Mar-03	6,138.03	0.00	46.65	70.22	0.00	0.00	0.00	0.00
15-Mar-03	5,959.30	0.00	0.00	0.00	0.00	0.00	0.00	0.00
16-Mar-03	6,199.70	0.00	0.00	0.00	0.00	0.00	0.00	0.00
17-Mar-03	6,167.22	0.00	44.96	96.12	0.00	0.00	0.00	0.00
18-Mar-03	5,862.80	0.00	22.59	417.11	0.00	0.00	0.00	0.00
19-Mar-03	6,370.60	0.00	0.00	0.00	0.00	0.00	0.00	0.00
20-Mar-03	5,727.87	0.00	46.66	72.77	0.00	0.00	0.00	0.00
21-Mar-03	6,160.10	0.00	45.25	77.95	0.00	0.00	0.00	0.00
22-Mar-03	5,656.60	0.00	0.00	0.00	0.00	0.00	0.00	0.00
23-Mar-03	5,468.60	0.00	0.00	0.00	0.00	0.00	0.00	0.00
24-Mar-03	5,771.78	0.00	22.18	122.64	0.00	0.00	0.00	0.00
25-Mar-03	5,276.36	0.00	44.19	100.35	0.00	0.00	0.00	0.00
26-Mar-03	5,672.84	0.00	22.08	123.18	0.00	0.00	0.00	0.00
27-Mar-03	5,965.90	0.00	0.00	0.00	0.00	0.00	0.00	0.00
28-Mar-03	5,931.49	0.00	90.03	147.28	0.00	0.00	0.00	0.00
29-Mar-03	6,182.80	0.00	0.00	0.00	0.00	0.00	0.00	0.00
30-Mar-03	6,139.50	0.00	0.00	0.00	0.00	0.00	0.00	0.00
31-Mar-03	5,827.97	0.00	0.00	70.93	0.00	0.00	0.00	0.00
Adjustment	2,800.00							
Total Burned	177,636.53	0.00	561.96	1,510.21	0.00	0.00	0.00	0.00
Total Delivered	163,580.34	0.00	561.96	1,565.08	0.00	0.00	0.00	0.00
HHV	8562	0	15000	7187	0	0	0	0
% Ash	4.45%	0.00%	7.05%	1.10%	0.00%	0.00%	0.00%	0.00%
Tons Ash	7,907.69	0.00	39.62	16.61	0.00	0.00	0.00	0.00

BIG STONE PLANT
FUEL BURN RECORD - page 1
Apr-03

DATE	Coal	P. Coke	TDF	Waste Seeds	Toner	Gran. Insul.	Canvas Belting	Plastic Chips
	(Tons)	(Tons)	(Tons)	(Tons)	(Tons)	(Tons)	(Tons)	(Tons)
1-Apr-03	5,563.81	0.00	22.09	73.40	0.00	0.00	0.00	0.00
2-Apr-03	5,828.17	0.00	22.34	69.09	0.00	0.00	0.00	0.00
3-Apr-03	5,440.20	0.00	0.00	0.00	0.00	0.00	0.00	0.00
4-Apr-03	5,785.41	0.00	22.24	171.15	0.00	0.00	0.00	0.00
5-Apr-03	6,027.70	0.00	0.00	0.00	0.00	0.00	0.00	0.00
6-Apr-03	5,921.70	0.00	0.00	0.00	0.00	0.00	0.00	0.00
7-Apr-03	6,107.43	0.00	19.79	96.28	0.00	0.00	0.00	0.00
8-Apr-03	6,021.43	0.00	22.25	72.12	0.00	0.00	0.00	0.00
9-Apr-03	5,992.65	0.00	0.00	23.05	0.00	0.00	0.00	0.00
10-Apr-03	6,040.10	0.00	0.00	0.00	0.00	0.00	0.00	0.00
11-Apr-03	5,759.20	0.00	44.97	20.73	0.00	0.00	0.00	0.00
12-Apr-03	5,021.35	0.00	0.00	0.00	21.35	0.00	0.00	0.00
13-Apr-03	5,995.50	0.00	0.00	0.00	0.00	0.00	0.00	0.00
14-Apr-03	5,846.61	0.00	21.87	23.42	0.00	0.00	0.00	0.00
15-Apr-03	6,072.20	0.00	0.00	0.00	0.00	0.00	0.00	0.00
16-Apr-03	5,651.65	0.00	44.32	46.13	0.00	0.00	0.00	0.00
17-Apr-03	6,275.50	0.00	0.00	0.00	0.00	0.00	0.00	0.00
18-Apr-03	6,208.24	0.00	22.40	23.46	0.00	0.00	0.00	0.00
19-Apr-03	5,907.50	0.00	0.00	0.00	0.00	0.00	0.00	0.00
20-Apr-03	6,086.50	0.00	0.00	0.00	0.00	0.00	0.00	0.00
21-Apr-03	5,906.60	0.00	46.60	0.00	0.00	0.00	0.00	0.00
22-Apr-03	3,986.91	0.00	22.79	0.00	0.00	0.00	0.00	0.00
23-Apr-03	5,485.18	0.00	23.22	0.00	0.00	0.00	0.00	0.00
24-Apr-03	5,787.10	0.00	0.00	0.00	0.00	0.00	0.00	0.00
25-Apr-03	5,903.63	0.00	68.87	22.40	0.00	0.00	0.00	0.00
26-Apr-03	909.30	0.00	0.00	0.00	0.00	0.00	0.00	0.00
27-Apr-03	2,884.70	0.00	0.00	0.00	0.00	0.00	0.00	0.00
28-Apr-03	5,998.40	0.00	0.00	0.00	0.00	0.00	0.00	0.00
29-Apr-03	5,001.50	0.00	0.00	0.00	0.00	0.00	0.00	0.00
30-Apr-03	5,389.63	0.00	90.93	24.24	0.00	0.00	0.00	0.00
Adjustment	0.00							
Total Burned	164,805.80	0.00	494.68	665.47	21.35	0.00	0.00	0.00
Total Delivered	182,856.19	0.00	494.68	665.47	21.35	0.00	0.00	0.00
HHV	8491	0	15000	7187	16932	0	0	0
% Ash	4.65%	0.00%	7.05%	1.10%	0.00%	0.00%	0.00%	0.00%
Tons Ash	7,657.92	0.00	34.87	7.32	0.00	0.00	0.00	0.00

BIG STONE PLANT
FUEL BURN RECORD - page 1
May-03

DATE	Coal	P. Coke	TDF	Waste Seeds	Toner	Gran. Insul.	Canvas Belting	Plastic Chips
	(Tons)	(Tons)	(Tons)	(Tons)	(Tons)	(Tons)	(Tons)	(Tons)
1-May-03	6,018.26	0.00	24.09	23.35	0.00	0.00	0.00	0.00
2-May-03	5,927.28	0.00	44.56	46.66	0.00	0.00	0.00	0.00
3-May-03	6,080.60	0.00	0.00	0.00	0.00	0.00	0.00	0.00
4-May-03	5,982.70	0.00	0.00	0.00	0.00	0.00	0.00	0.00
5-May-03	6,266.11	0.00	26.89	0.00	0.00	0.00	0.00	0.00
6-May-03	5,945.43	0.00	46.37	0.00	0.00	0.00	0.00	0.00
7-May-03	5,759.10	0.00	0.00	0.00	0.00	0.00	0.00	0.00
8-May-03	4,741.50	0.00	0.00	0.00	0.00	0.00	0.00	0.00
9-May-03	6,216.94	0.00	48.64	46.02	0.00	0.00	0.00	0.00
10-May-03	6,429.90	0.00	0.00	0.00	0.00	0.00	0.00	0.00
11-May-03	6,585.20	0.00	0.00	0.00	0.00	0.00	0.00	0.00
12-May-03	6,301.40	0.00	0.00	0.00	0.00	0.00	0.00	0.00
13-May-03	6,073.81	0.00	22.39	180.00	0.00	0.00	0.00	0.00
14-May-03	6,003.37	0.00	46.04	182.69	0.00	0.00	0.00	0.00
15-May-03	6,222.40	0.00	0.00	0.00	0.00	0.00	0.00	0.00
16-May-03	5,882.91	0.00	26.53	140.16	0.00	0.00	0.00	0.00
17-May-03	6,158.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
18-May-03	6,133.60	0.00	0.00	0.00	0.00	0.00	0.00	0.00
19-May-03	6,011.02	0.00	69.35	71.33	0.00	0.00	0.00	0.00
20-May-03	6,156.23	0.00	69.86	73.01	0.00	0.00	0.00	0.00
21-May-03	6,109.67	0.00	0.00	93.83	0.00	0.00	0.00	0.00
22-May-03	5,943.65	0.00	22.29	47.96	0.00	0.00	0.00	0.00
23-May-03	5,777.39	0.00	45.17	24.04	0.00	0.00	0.00	0.00
24-May-03	5,838.90	0.00	0.00	0.00	0.00	0.00	0.00	0.00
25-May-03	5,751.90	0.00	0.00	0.00	0.00	0.00	0.00	0.00
26-May-03	5,543.30	0.00	0.00	0.00	0.00	0.00	0.00	0.00
27-May-03	5,637.15	0.00	22.39	24.06	0.00	0.00	0.00	0.00
28-May-03	5,847.93	0.00	45.07	0.00	0.00	0.00	0.00	0.00
29-May-03	6,051.70	0.00	0.00	0.00	0.00	0.00	0.00	0.00
30-May-03	5,865.58	0.00	67.36	116.26	0.00	0.00	0.00	0.00
31-May-03	5,579.90	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Adjustment	0.00							
Total Burned	184,842.83	0.00	627.00	1,069.37	0.00	0.00	0.00	0.00
Total Delivered	183,962.43	0.00	627.00	1,069.37	0.00	0.00	0.00	0.00
HHV	8560	0	15000	7187	0	0	0	0
% Ash	4.59%	0.00%	7.05%	1.10%	0.00%	0.00%	0.00%	0.00%
Tons Ash	8,486.63	0.00	44.20	11.76	0.00	0.00	0.00	0.00

BIG STONE PLANT
FUEL BURN RECORD - page 1
Jun-03

DATE	Coal	P. Coke	TDF	Waste Seeds	Toner	Gran. Insul.	Canvas Belting	Plastic Chips
	(Tons)	(Tons)	(Tons)	(Tons)	(Tons)	(Tons)	(Tons)	(Tons)
1-Jun-03	5,439.10	0.00	0.00	0.00	0.00	0.00	0.00	0.00
2-Jun-03	5,564.42	0.00	110.79	67.89	0.00	0.00	0.00	0.00
3-Jun-03	4,109.30	0.00	0.00	0.00	0.00	0.00	0.00	0.00
4-Jun-03	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
5-Jun-03	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
6-Jun-03	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
7-Jun-03	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
8-Jun-03	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
9-Jun-03	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
10-Jun-03	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
11-Jun-03	1,062.40	0.00	0.00	0.00	0.00	0.00	0.00	0.00
12-Jun-03	5,927.60	0.00	0.00	0.00	0.00	0.00	0.00	0.00
13-Jun-03	5,769.17	0.00	22.39	264.44	0.00	0.00	0.00	0.00
14-Jun-03	6,184.20	0.00	0.00	0.00	0.00	0.00	0.00	0.00
15-Jun-03	6,104.80	0.00	0.00	0.00	0.00	0.00	0.00	0.00
16-Jun-03	5,980.04	0.00	166.09	23.97	0.00	0.00	0.00	0.00
17-Jun-03	5,115.89	0.00	67.18	120.33	0.00	0.00	0.00	0.00
18-Jun-03	5,903.29	0.00	65.80	174.41	0.00	0.00	0.00	0.00
19-Jun-03	6,263.74	0.00	22.79	195.97	0.00	0.00	0.00	0.00
20-Jun-03	5,968.70	0.00	73.28	319.12	0.00	0.00	0.00	0.00
21-Jun-03	5,994.10	0.00	0.00	0.00	0.00	0.00	0.00	0.00
22-Jun-03	5,455.90	0.00	0.00	0.00	0.00	0.00	0.00	0.00
23-Jun-03	6,339.77	0.00	25.69	167.34	0.00	0.00	0.00	0.00
24-Jun-03	6,446.21	0.00	46.45	176.04	0.00	0.00	0.00	0.00
25-Jun-03	6,148.46	0.00	72.23	445.61	0.00	0.00	0.00	0.00
26-Jun-03	5,846.29	0.00	45.47	388.54	0.00	0.00	0.00	0.00
27-Jun-03	6,209.24	0.00	46.04	158.02	0.00	0.00	0.00	0.00
28-Jun-03	5,261.90	0.00	0.00	0.00	0.00	0.00	0.00	0.00
29-Jun-03	5,916.40	0.00	0.00	0.00	0.00	0.00	0.00	0.00
30-Jun-03	5,968.60	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Adjustment	-1,000.00							
Burned	127,979.52	0.00	764.20	2,501.68	0.00	0.00	0.00	0.00
Delivered	129,386.06	0.00	810.36	2,674.20	0.00	0.00	0.00	0.00
HHV	8482	0	15000	7187	0	0	0	0
% Ash	4.57%	0.00%	7.04%	1.10%	0.00%	0.00%	0.00%	0.00%
Tons Ash	5,842.41	0.00	53.80	27.52	0.00	0.00	0.00	0.00

BIG STONE PLANT
FUEL BURN RECORD - page 1
Jul-03

DATE	Coal	P. Coke	TDF	Waste Seeds	Toner	Gran. Insul.	Canvas Belting	Plastic Chips
	(Tons)	(Tons)	(Tons)	(Tons)	(Tons)	(Tons)	(Tons)	(Tons)
1-Jul-03	5,608.91	0.00	92.25	380.44	0.00	0.00	0.00	0.00
2-Jul-03	6,015.40	0.00	27.52	474.68	0.00	0.00	0.00	0.00
3-Jul-03	6,544.89	0.00	73.64	23.87	0.00	0.00	0.00	0.00
4-Jul-03	4,873.10	0.00	0.00	0.00	0.00	0.00	0.00	0.00
5-Jul-03	5,833.60	0.00	0.00	0.00	0.00	0.00	0.00	0.00
6-Jul-03	6,044.60	0.00	0.00	0.00	0.00	0.00	0.00	0.00
7-Jul-03	5,899.67	0.00	71.91	71.12	0.00	0.00	0.00	0.00
8-Jul-03	6,241.19	0.00	25.32	94.59	0.00	0.00	0.00	0.00
9-Jul-03	6,305.42	0.00	96.76	91.92	0.00	0.00	0.00	0.00
10-Jul-03	5,807.50	0.00	100.00	75.00	0.00	0.00	0.00	0.00
11-Jul-03	5,939.50	0.00	0.00	0.00	0.00	0.00	0.00	0.00
12-Jul-03	6,269.10	0.00	0.00	0.00	0.00	0.00	0.00	0.00
13-Jul-03	6,282.60	0.00	0.00	0.00	0.00	0.00	0.00	0.00
14-Jul-03	5,493.97	0.00	70.85	39.18	0.00	0.00	0.00	0.00
15-Jul-03	6,311.10	0.00	24.00	117.93	26.47	0.00	0.00	0.00
16-Jul-03	6,525.20	0.00	0.00	0.00	0.00	0.00	0.00	0.00
17-Jul-03	6,477.53	0.00	74.24	113.33	0.00	0.00	0.00	0.00
18-Jul-03	6,706.77	0.00	22.62	48.41	0.00	0.00	0.00	0.00
19-Jul-03	6,507.10	0.00	0.00	0.00	0.00	0.00	0.00	0.00
20-Jul-03	6,703.70	0.00	0.00	0.00	0.00	0.00	0.00	0.00
21-Jul-03	6,560.20	0.00	0.00	0.00	0.00	0.00	0.00	0.00
22-Jul-03	6,099.20	0.00	0.00	0.00	0.00	0.00	0.00	0.00
23-Jul-03	6,304.46	0.00	162.95	95.89	0.00	0.00	0.00	0.00
24-Jul-03	6,202.95	0.00	72.30	141.55	0.00	0.00	0.00	0.00
25-Jul-03	5,521.04	0.00	46.39	92.57	0.00	0.00	0.00	0.00
26-Jul-03	5,869.10	0.00	0.00	0.00	0.00	0.00	0.00	0.00
27-Jul-03	6,624.50	0.00	0.00	0.00	0.00	0.00	0.00	0.00
28-Jul-03	6,418.90	0.00	93.00	72.50	0.00	0.00	0.00	0.00
29-Jul-03	6,652.26	0.00	24.17	48.67	0.00	0.00	0.00	0.00
30-Jul-03	6,493.44	0.00	70.91	94.55	0.00	0.00	0.00	0.00
31-Jul-03	6,868.90	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Adjustment	0.00							
Total Burned	192,005.80	0.00	1,148.83	2,076.20	26.47	0.00	0.00	0.00
Total Delivered	154,635.98	0.00	1,271.15	1,974.87	26.47	0.00	0.00	0.00
HHV	8561	0	15000	7187	16932	0	0	0
% Ash	4.61%	0.00%	7.04%	1.10%	0.00%	0.00%	0.00%	0.00%
Tons Ash	8,860.09	0.00	80.88	22.84	0.00	0.00	0.00	0.00

BIG STONE PLANT
FUEL BURN RECORD - page 1
Aug-03

DATE	Coal	P. Coke	TDF	Waste Seeds	Toner	Gran. Insul.	Canvas Belting	Plastic Chips
	(Tons)	(Tons)	(Tons)	(Tons)	(Tons)	(Tons)	(Tons)	(Tons)
1-Aug-03	6,743.00	0.00	133.00	50.00	0.00	0.00	0.00	0.00
2-Aug-03	6,317.90	0.00	133.00	46.00	0.00	0.00	0.00	0.00
3-Aug-03	6,319.74	0.00	131.88	45.98	0.00	0.00	0.00	0.00
4-Aug-03	6,600.60	0.00	0.00	0.00	0.00	0.00	0.00	0.00
5-Aug-03	6,103.03	0.00	237.82	229.15	0.00	0.00	0.00	0.00
6-Aug-03	6,689.25	0.00	70.01	61.74	0.00	0.00	0.00	0.00
7-Aug-03	6,693.50	0.00	50.00	50.00	0.00	0.00	0.00	0.00
8-Aug-03	6,789.10	0.00	0.00	0.00	0.00	0.00	0.00	0.00
9-Aug-03	6,780.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
10-Aug-03	6,640.30	0.00	0.00	0.00	0.00	0.00	0.00	0.00
11-Aug-03	6,610.40	0.00	100.00	100.00	0.00	0.00	0.00	0.00
12-Aug-03	6,517.90	0.00	47.40	0.00	0.00	0.00	0.00	0.00
13-Aug-03	6,741.74	0.00	73.02	4.04	0.00	0.00	0.00	0.00
14-Aug-03	6,556.76	0.00	95.61	42.73	0.00	0.00	0.00	0.00
15-Aug-03	6,450.81	0.00	141.44	146.75	0.00	0.00	0.00	0.00
16-Aug-03	6,755.10	0.00	0.00	0.00	0.00	0.00	0.00	0.00
17-Aug-03	6,812.20	0.00	0.00	0.00	0.00	0.00	0.00	0.00
18-Aug-03	6,816.46	0.00	91.94	0.00	0.00	0.00	0.00	0.00
19-Aug-03	6,597.90	0.00	100.00	75.00	0.00	0.00	0.00	0.00
20-Aug-03	6,597.61	0.00	69.93	81.46	0.00	0.00	0.00	0.00
21-Aug-03	6,665.60	0.00	50.00	50.00	0.00	0.00	0.00	0.00
22-Aug-03	5,870.40	0.00	119.63	440.07	0.00	0.00	0.00	0.00
23-Aug-03	5,911.43	0.00	0.00	440.07	0.00	0.00	0.00	0.00
24-Aug-03	5,922.23	0.00	0.00	440.07	0.00	0.00	0.00	0.00
25-Aug-03	5,927.41	0.00	300.00	294.19	0.00	0.00	0.00	0.00
26-Aug-03	6,611.26	0.00	0.00	70.04	0.00	0.00	0.00	0.00
27-Aug-03	6,262.98	0.00	0.00	241.62	0.00	0.00	0.00	0.00
28-Aug-03	6,548.60	0.00	10.14	24.16	0.00	0.00	0.00	0.00
29-Aug-03	6,496.20	0.00	75.00	100.00	0.00	0.00	0.00	0.00
30-Aug-03	6,021.40	0.00	50.00	100.00	0.00	0.00	0.00	0.00
31-Aug-03	5,848.66	0.00	68.17	54.77	0.00	0.00	0.00	0.00
Adjustment	0.00							
Total Burned	200,219.47	0.00	2,147.99	3,187.84	0.00	0.00	0.00	0.00
Total Delivered	184,120.00	0.00	1,979.51	3,116.65	0.00	0.00	0.00	0.00
HHV	8575	0	15000	7187	0	0	0	0
% Ash	4.70%	0.00%	7.04%	1.10%	0.00%	0.00%	0.00%	0.00%
Tons Ash	9,417.23	0.00	151.22	35.07	0.00	0.00	0.00	0.00

BIG STONE PLANT
FUEL BURN RECORD - page 1
Sep-03

DATE	Coal (Tons)	P. Coke (Tons)	TDF (Tons)	Waste Seeds (Tons)	Toner (Tons)	Gran. Insul. (Tons)	Canvas Belting (Tons)	Plastic Chips (Tons)
1-Sep-03	6,062.70	0.00	0.00	0.00	0.00	0.00	0.00	0.00
2-Sep-03	6,086.80	0.00	0.00	0.00	0.00	0.00	0.00	0.00
3-Sep-03	5,671.17	0.00	210.82	68.41	0.00	0.00	0.00	0.00
4-Sep-03	5,901.99	0.00	72.78	46.73	0.00	0.00	0.00	0.00
5-Sep-03	6,225.60	0.00	100.00	50.00	0.00	0.00	0.00	0.00
6-Sep-03	6,367.08	0.00	121.38	45.94	0.00	0.00	0.00	0.00
7-Sep-03	6,247.40	0.00	0.00	0.00	0.00	0.00	0.00	0.00
8-Sep-03	6,102.54	0.00	118.94	45.62	0.00	0.00	0.00	0.00
9-Sep-03	6,146.21	0.00	93.05	23.64	0.00	0.00	0.00	0.00
10-Sep-03	6,064.33	0.00	73.44	22.13	0.00	0.00	0.00	0.00
11-Sep-03	6,289.50	0.00	50.00	25.00	0.00	0.00	0.00	0.00
12-Sep-03	6,321.90	0.00	120.00	75.00	0.00	0.00	0.00	0.00
13-Sep-03	6,091.00	0.00	120.00	75.00	0.00	0.00	0.00	0.00
14-Sep-03	5,974.33	0.00	122.40	61.67	0.00	0.00	0.00	0.00
15-Sep-03	6,299.81	0.00	46.85	76.14	0.00	0.00	0.00	0.00
16-Sep-03	5,977.12	0.00	50.40	97.98	0.00	0.00	0.00	0.00
17-Sep-03	5,232.80	0.00	50.00	100.00	0.00	0.00	0.00	0.00
18-Sep-03	5,167.98	0.00	72.67	23.15	0.00	0.00	0.00	0.00
19-Sep-03	5,666.01	0.00	42.13	57.86	0.00	0.00	0.00	0.00
20-Sep-03	6,506.90	0.00	0.00	0.00	0.00	0.00	0.00	0.00
21-Sep-03	6,583.80	0.00	0.00	0.00	0.00	0.00	0.00	0.00
22-Sep-03	6,181.04	0.00	94.33	274.73	0.00	0.00	0.00	0.00
23-Sep-03	5,796.03	0.00	72.63	25.94	0.00	0.00	0.00	0.00
24-Sep-03	6,275.00	0.00	25.47	13.83	0.00	0.00	0.00	0.00
25-Sep-03	6,363.60	0.00	25.00	25.00	0.00	0.00	0.00	0.00
26-Sep-03	6,267.41	0.00	66.80	107.39	0.00	0.00	0.00	0.00
27-Sep-03	5,787.30	0.00	0.00	100.00	0.00	0.00	0.00	0.00
28-Sep-03	6,336.90	0.00	0.00	100.00	0.00	0.00	0.00	0.00
29-Sep-03	6,446.52	0.00	95.13	46.25	0.00	0.00	0.00	0.00
30-Sep-03	6,170.55	0.00	125.33	23.02	0.00	0.00	0.00	0.00
Adjustment	3,000.00							
Total Burned	185,611.32	0.00	1,969.55	1,610.43	0.00	0.00	0.00	0.00
Total Delivered	194,770.48	0.00	1,969.55	1,610.43	0.00	0.00	0.00	0.00
HHV	8530	0	15000	7187	0	0	0	0
% Ash	4.59%	0.00	7.04%	1.10%	0.00%	0.00%	0.00%	0.00%
Tons Ash	8,526.64	0.00	51.48	12.52	0.00	0.00	0.00	0.00

BIG STONE PLANT
FUEL BURN RECORD - page 1
Oct-03

DATE	Coal	P. Coke	TDF	Waste Seeds	Toner	Gran. Insul.	Canvas Belting	Plastic Chips
	(Tons)	(Tons)	(Tons)	(Tons)	(Tons)	(Tons)	(Tons)	(Tons)
1-Oct-03	6,319.50	0.00	0.00	0.00	0.00	0.00	0.00	0.00
2-Oct-03	6,536.17	0.00	45.23	0.00	0.00	0.00	0.00	0.00
3-Oct-03	6,161.23	0.00	296.40	86.67	0.00	0.00	0.00	0.00
4-Oct-03	6,153.70	0.00	0.00	0.00	0.00	0.00	0.00	0.00
5-Oct-03	6,127.10	0.00	0.00	0.00	0.00	0.00	0.00	0.00
6-Oct-03	4,974.05	0.00	147.85	0.00	0.00	0.00	0.00	0.00
7-Oct-03	5,985.37	0.00	119.23	0.00	0.00	0.00	0.00	0.00
8-Oct-03	5,818.22	0.00	122.59	23.79	0.00	0.00	0.00	0.00
9-Oct-03	5,941.70	0.00	100.00	25.00	0.00	0.00	0.00	0.00
10-Oct-03	6,004.76	0.00	95.84	125.00	0.00	0.00	0.00	0.00
11-Oct-03	6,554.80	0.00	0.00	125.00	0.00	0.00	0.00	0.00
12-Oct-03	6,555.37	0.00	0.00	103.33	0.00	0.00	0.00	0.00
13-Oct-03	6,034.57	0.00	96.92	68.61	0.00	0.00	0.00	0.00
14-Oct-03	6,098.22	0.00	92.88	0.00	0.00	0.00	0.00	0.00
15-Oct-03	5,814.86	0.00	120.71	220.33	0.00	0.00	0.00	0.00
16-Oct-03	6,119.60	0.00	0.00	0.00	0.00	0.00	0.00	0.00
17-Oct-03	6,173.77	0.00	146.93	0.00	0.00	0.00	0.00	0.00
18-Oct-03	5,794.62	0.00	144.46	98.92	0.00	0.00	0.00	0.00
19-Oct-03	5,757.80	0.00	0.00	0.00	0.00	0.00	0.00	0.00
20-Oct-03	5,855.49	0.00	120.98	41.93	0.00	0.00	0.00	0.00
21-Oct-03	6,047.70	0.00	69.50	16.10	0.00	0.00	0.00	0.00
22-Oct-03	6,050.10	0.00	0.00	0.00	0.00	0.00	0.00	0.00
23-Oct-03	6,053.61	0.00	73.99	0.00	0.00	0.00	0.00	0.00
24-Oct-03	4,424.76	0.00	151.22	149.32	0.00	0.00	0.00	0.00
25-Oct-03	6,050.20	0.00	0.00	0.00	0.00	0.00	0.00	0.00
26-Oct-03	6,437.20	0.00	0.00	0.00	0.00	0.00	0.00	0.00
27-Oct-03	5,984.16	0.00	71.57	71.57	0.00	0.00	0.00	0.00
28-Oct-03	5,872.19	0.00	95.15	49.26	0.00	0.00	0.00	0.00
29-Oct-03	6,055.15	0.00	95.25	22.40	0.00	0.00	0.00	0.00
30-Oct-03	5,880.57	0.00	118.97	117.46	0.00	0.00	0.00	0.00
31-Oct-03	5,939.92	0.00	141.81	145.87	0.00	0.00	0.00	0.00
Adjustment	6,000.00							
Total Burned	191,576.46	0.00	2,467.48	1,490.56	0.00	0.00	0.00	0.00
Total Delivered	209,506.85	0.00	2,467.48	1,490.56	0.00	0.00	0.00	0.00
HHV	8630	0	15000	7187	0	0	0	0
% Ash	4.83%	0.00%	7.04%	1.10%	0.00%	0.00%	0.00%	0.00%
Tons Ash	9,245.59	0.00	51.48	12.52	0.00	0.00	0.00	0.00

BIG STONE PLANT
FUEL BURN RECORD - page 1
Nov-03

DATE	Coal	P. Coke	TDF	Waste Seeds	Toner	Coyote Lignite	Canvas Belting	Plastic Chips
	(Tons)	(Tons)	(Tons)	(Tons)	(Tons)	(Tons)	(Tons)	(Tons)
1-Nov-03	6,484.30	0.00	0.00	0.00	0.00	0.00	0.00	0.00
2-Nov-03	6,474.40	0.00	0.00	0.00	0.00	0.00	0.00	0.00
3-Nov-03	6,412.21	0.00	25.77	46.72	0.00	0.00	0.00	0.00
4-Nov-03	6,243.01	0.00	144.47	46.62	0.00	0.00	0.00	0.00
5-Nov-03	6,174.34	0.00	50.92	122.44	0.00	0.00	0.00	0.00
6-Nov-03	6,346.40	0.00	49.08	22.32	0.00	0.00	0.00	0.00
7-Nov-03	6,248.46	0.00	71.89	146.85	0.00	0.00	0.00	0.00
8-Nov-03	6,498.10	0.00	0.00	0.00	0.00	0.00	0.00	0.00
9-Nov-03	6,083.10	0.00	0.00	0.00	0.00	0.00	0.00	0.00
10-Nov-03	6,156.57	0.00	116.35	99.78	0.00	0.00	0.00	0.00
11-Nov-03	6,259.45	0.00	47.69	21.96	0.00	0.00	0.00	0.00
12-Nov-03	6,308.90	0.00	0.00	0.00	0.00	0.00	0.00	0.00
13-Nov-03	6,683.30	0.00	0.00	0.00	0.00	0.00	0.00	0.00
14-Nov-03	6,373.22	0.00	45.69	209.89	0.00	0.00	0.00	0.00
15-Nov-03	6,382.90	0.00	0.00	0.00	0.00	0.00	0.00	0.00
16-Nov-03	6,384.60	0.00	0.00	0.00	0.00	0.00	0.00	0.00
17-Nov-03	6,274.89	0.00	98.81	0.00	0.00	0.00	0.00	0.00
18-Nov-03	6,086.07	0.00	166.07	26.16	0.00	71.00	0.00	0.00
19-Nov-03	6,099.04	0.00	123.90	69.86	0.00	0.00	0.00	0.00
20-Nov-03	6,122.30	0.00	100.00	25.00	0.00	0.00	0.00	0.00
21-Nov-03	6,488.06	0.00	0.00	94.94	0.00	0.00	0.00	0.00
22-Nov-03	6,415.90	0.00	0.00	0.00	0.00	0.00	0.00	0.00
23-Nov-03	6,336.40	0.00	0.00	0.00	0.00	0.00	0.00	0.00
24-Nov-03	6,750.64	0.00	23.69	107.87	0.00	0.00	0.00	0.00
25-Nov-03	6,614.30	0.00	140.83	25.57	0.00	0.00	0.00	0.00
26-Nov-03	6,731.28	0.00	49.32	25.80	0.00	0.00	0.00	0.00
27-Nov-03	6,078.70	0.00	0.00	0.00	0.00	0.00	0.00	0.00
28-Nov-03	6,769.58	0.00	22.22	0.00	0.00	0.00	0.00	0.00
29-Nov-03	6,704.20	0.00	0.00	0.00	0.00	0.00	0.00	0.00
30-Nov-03	6,171.30	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Adjustment	3,000.00							
Total Burned	194,155.92	0.00	1,276.70	1,091.78	0.00	71.00	0.00	0.00
Total Delivered	181,630.49	0.00	1,276.70	1,091.78	0.00	71.00	0.00	0.00
HHV	8521	0	15000	7187	16932	6500		
% Ash	4.77%	0.00%	7.04%	1.10%	0.00%	0.00%		
Tons Ash	9,263.57	0.00	89.88	12.01	0.00	0.00	0.00	0.00

BIG STONE PLANT
FUEL BURN RECORD - page 1
Dec-03

DATE	Coal	P. Coke	TDF	Waste Seeds	Toner	Gran. Insul.	Canvas Belting	Plastic Chips
	(Tons)	(Tons)	(Tons)	(Tons)	(Tons)	(Tons)	(Tons)	(Tons)
1-Dec-03	6,499.83	0.00	97.26	26.21	0.00	0.00	0.00	0.00
2-Dec-03	6,494.57	0.00	22.17	24.39	27.17	0.00	0.00	0.00
3-Dec-03	6,512.82	0.00	22.21	22.57	0.00	0.00	0.00	0.00
4-Dec-03	6,367.76	0.00	0.00	99.74	0.00	0.00	0.00	0.00
5-Dec-03	4,476.77	0.00	50.83	0.00	0.00	0.00	0.00	0.00
6-Dec-03	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
7-Dec-03	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
8-Dec-03	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
9-Dec-03	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
10-Dec-03	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
11-Dec-03	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
12-Dec-03	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
13-Dec-03	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
14-Dec-03	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
15-Dec-03	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
16-Dec-03	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
17-Dec-03	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
18-Dec-03	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
19-Dec-03	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
20-Dec-03	213.10	0.00	0.00	0.00	0.00	0.00	0.00	0.00
21-Dec-03	3,794.80	0.00	0.00	0.00	0.00	0.00	0.00	0.00
22-Dec-03	5,939.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
23-Dec-03	6,188.10	0.00	0.00	0.00	0.00	0.00	0.00	0.00
24-Dec-03	6,275.20	0.00	0.00	0.00	0.00	0.00	0.00	0.00
25-Dec-03	4,964.70	0.00	0.00	0.00	0.00	0.00	0.00	0.00
26-Dec-03	5,966.36	0.00	22.14	0.00	0.00	0.00	0.00	0.00
27-Dec-03	5,954.60	0.00	0.00	0.00	0.00	0.00	0.00	0.00
28-Dec-03	6,021.40	0.00	0.00	0.00	0.00	0.00	0.00	0.00
29-Dec-03	6,538.93	0.00	23.07	0.00	0.00	0.00	0.00	0.00
30-Dec-03	6,487.71	0.00	0.00	25.09	0.00	0.00	0.00	0.00
31-Dec-03	6,581.50	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Adjustment	1,000.00							
Total Burned	96,277.15	0.00	237.68	198.00	27.17	0.00	0.00	0.00
Total Delivered	124,513.74	0.00	237.68	198.00	27.17	0.00	0.00	0.00
HHV	8492	0	15000	7187	0	0	0	0
% Ash	4.86%	0.00%	7.04%	1.10%	0.00%	0.00%	0.00%	0.00%
Tons Ash	4,679.14	0.00	70.76	23.60	0.00	0.00	0.00	0.00

BIG STONE PLANT
FUEL BURN RECORD - page 1
Jan-04

DATE	Coal	P. Coke	TDF	Waste Seeds	Toner	Gran. Insul.	Canvas Belting	Plastic Chips
	(Tons)	(Tons)	(Tons)	(Tons)	(Tons)	(Tons)	(Tons)	(Tons)
1-Jan-04	6,298.10	0.00	0.00	0.00	0.00	0.00	0.00	0.00
2-Jan-04	6,031.73	0.00	22.42	93.55	0.00	0.00	0.00	0.00
3-Jan-04	6,490.80	0.00	0.00	0.00	0.00	0.00	0.00	0.00
4-Jan-04	6,644.90	0.00	0.00	0.00	0.00	0.00	0.00	0.00
5-Jan-04	6,604.40	0.00	0.00	35.70	0.00	0.00	0.00	0.00
6-Jan-04	6,618.66	0.00	26.00	25.64	0.00	0.00	0.00	0.00
7-Jan-04	6,569.30	0.00	0.00	0.00	0.00	0.00	0.00	0.00
8-Jan-04	6,659.53	0.00	22.88	23.09	0.00	0.00	0.00	0.00
9-Jan-04	6,619.80	0.00	45.94	142.36	0.00	0.00	0.00	0.00
10-Jan-04	6,670.40	0.00	0.00	0.00	0.00	0.00	0.00	0.00
11-Jan-04	5,849.60	0.00	0.00	0.00	0.00	0.00	0.00	0.00
12-Jan-04	6,277.63	0.00	22.52	66.25	0.00	0.00	0.00	0.00
13-Jan-04	6,098.33	0.00	23.07	0.00	0.00	0.00	0.00	0.00
14-Jan-04	6,496.82	0.00	0.00	22.88	0.00	0.00	0.00	0.00
15-Jan-04	6,398.40	0.00	0.00	0.00	0.00	0.00	0.00	0.00
16-Jan-04	6,395.40	0.00	46.31	73.99	0.00	0.00	0.00	0.00
17-Jan-04	6,236.90	0.00	0.00	0.00	0.00	0.00	0.00	0.00
18-Jan-04	6,743.80	0.00	0.00	0.00	0.00	0.00	0.00	0.00
19-Jan-04	6,715.15	0.00	0.00	73.45	0.00	0.00	0.00	0.00
20-Jan-04	6,685.50	0.00	22.47	25.43	0.00	0.00	0.00	0.00
21-Jan-04	6,479.60	0.00	0.00	0.00	0.00	0.00	0.00	0.00
22-Jan-04	6,444.04	0.00	22.97	122.59	0.00	0.00	0.00	0.00
23-Jan-04	6,446.14	0.00	0.00	49.86	0.00	0.00	0.00	0.00
24-Jan-04	6,688.10	0.00	0.00	0.00	0.00	0.00	0.00	0.00
25-Jan-04	6,613.60	0.00	0.00	0.00	0.00	0.00	0.00	0.00
26-Jan-04	6,632.17	0.00	0.00	23.63	0.00	0.00	0.00	0.00
27-Jan-04	6,768.70	0.00	22.30	0.00	0.00	0.00	0.00	0.00
28-Jan-04	6,777.40	0.00	0.00	0.00	0.00	0.00	0.00	0.00
29-Jan-04	6,738.10	0.00	0.00	0.00	0.00	0.00	0.00	0.00
30-Jan-04	6,630.83	0.00	0.00	110.17	0.00	0.00	0.00	0.00
31-Jan-04	6,853.60	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Adjustment	3,500.00							
Total Burned	205,677.43	0.00	276.88	888.59	0.00	0.00	0.00	0.00
Total Delivered	177,708.33	0.00	276.88	888.59	0.00	0.00	0.00	0.00
HHV	8540	0	15000	7187	1632	0	0	0
% Ash	4.71%	0.00	7.04%	4.00%	0.00%	0.00%	0.00%	0.00%
Tons Ash	9,692.63	0.00	19.49	35.54	0.00	0.00	0.00	0.00

BIG STONE PLANT
FUEL BURN RECORD - page 1
Feb-04

DATE	Coal	P. Coke	TDF	Waste Seeds	Toner	Gran. Insul.	Canvas Belting	Plastic Chips
	(Tons)	(Tons)	(Tons)	(Tons)	(Tons)	(Tons)	(Tons)	(Tons)
1-Feb-04	6,271.90	0.00	0.00	0.00	0.00	0.00	0.00	0.00
2-Feb-04	6,495.60	0.00	0.00	0.00	0.00	0.00	0.00	0.00
3-Feb-04	6,676.34	0.00	0.00	74.26	0.00	0.00	0.00	0.00
4-Feb-04	6,867.50	0.00	0.00	0.00	0.00	0.00	0.00	0.00
5-Feb-04	6,656.28	0.00	22.32	0.00	0.00	0.00	0.00	0.00
6-Feb-04	6,551.50	0.00	0.00	0.00	0.00	0.00	0.00	0.00
7-Feb-04	6,694.10	0.00	0.00	0.00	0.00	0.00	0.00	0.00
8-Feb-04	6,802.10	0.00	0.00	0.00	0.00	0.00	0.00	0.00
9-Feb-04	6,555.50	0.00	0.00	67.50	0.00	0.00	0.00	0.00
10-Feb-04	6,428.92	0.00	0.00	50.28	0.00	0.00	0.00	0.00
11-Feb-04	6,508.50	0.00	0.00	0.00	0.00	0.00	0.00	0.00
12-Feb-04	6,770.16	0.00	23.85	23.09	0.00	0.00	0.00	0.00
13-Feb-04	6,689.70	0.00	0.00	0.00	0.00	0.00	0.00	0.00
14-Feb-04	6,731.40	0.00	0.00	0.00	0.00	0.00	0.00	0.00
15-Feb-04	6,807.20	0.00	0.00	0.00	0.00	0.00	0.00	0.00
16-Feb-04	6,763.00	0.00	22.60	0.00	0.00	0.00	0.00	0.00
17-Feb-04	6,641.30	0.00	0.00	0.00	0.00	0.00	0.00	0.00
18-Feb-04	6,703.83	0.00	0.00	20.67	0.00	0.00	0.00	0.00
19-Feb-04	6,538.38	0.00	22.02	0.00	0.00	0.00	0.00	0.00
20-Feb-04	6,568.78	0.00	22.82	0.00	0.00	0.00	0.00	0.00
21-Feb-04	6,781.30	0.00	0.00	0.00	0.00	0.00	0.00	0.00
22-Feb-04	6,488.60	0.00	0.00	0.00	0.00	0.00	0.00	0.00
23-Feb-04	6,756.80	0.00	0.00	0.00	0.00	0.00	0.00	0.00
24-Feb-04	6,797.10	0.00	0.00	0.00	0.00	0.00	0.00	0.00
25-Feb-04	6,742.48	0.00	23.62	16.10	0.00	0.00	0.00	0.00
26-Feb-04	6,575.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
27-Feb-04	6,791.38	0.00	22.42	0.00	0.00	0.00	0.00	0.00
28-Feb-04	5,821.10	0.00	0.00	0.00	0.00	0.00	0.00	0.00
29-Feb-04	6,755.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Adjustment	1,500.00							
Total Burned	193,730.75	0.00	159.65	251.90	0.00	0.00	0.00	0.00
Total Delivered	186,986.38	0.00	159.65	251.90	0.00	0.00	0.00	0.00
HHV	8508	0	15000	7187	16932	0	0	0
% Ash	4.76%	0.00%	7.05%	1.10%	0.00%	0.00%	0.00%	0.00%
Tons Ash	9,220.63	0.00	11.26	2.77	0.00	0.00	0.00	0.00

BIG STONE PLANT
FUEL BURN RECORD - page 1
Mar-04

DATE	Coal	P. Coke	TDF	Waste Seeds	Toner	Gran. Insul.	Canvas Belting	Plastic Chips
	(Tons)	(Tons)	(Tons)	(Tons)	(Tons)	(Tons)	(Tons)	(Tons)
1-Mar-04	6,745.64	0.00	22.66	0.00	0.00	0.00	0.00	0.00
2-Mar-04	6,669.80	0.00	0.00	0.00	0.00	0.00	0.00	0.00
3-Mar-04	6,712.50	0.00	0.00	0.00	0.00	0.00	0.00	0.00
4-Mar-04	6,806.30	0.00	0.00	0.00	0.00	0.00	0.00	0.00
5-Mar-04	6,755.47	0.00	22.33	0.00	0.00	0.00	0.00	0.00
6-Mar-04	6,639.10	0.00	0.00	0.00	0.00	0.00	0.00	0.00
7-Mar-04	6,714.90	0.00	0.00	0.00	0.00	0.00	0.00	0.00
8-Mar-04	6,753.55	0.00	0.00	19.25	0.00	0.00	0.00	0.00
9-Mar-04	6,859.30	0.00	0.00	0.00	0.00	0.00	0.00	0.00
10-Mar-04	6,827.09	0.00	22.41	0.00	0.00	0.00	0.00	0.00
11-Mar-04	6,723.99	0.00	22.51	0.00	0.00	0.00	0.00	0.00
12-Mar-04	6,794.60	0.00	0.00	0.00	0.00	0.00	0.00	0.00
13-Mar-04	6,824.50	0.00	0.00	0.00	0.00	0.00	0.00	0.00
14-Mar-04	6,712.40	0.00	0.00	0.00	0.00	0.00	0.00	0.00
15-Mar-04	6,816.55	0.00	65.57	21.88	0.00	0.00	0.00	0.00
16-Mar-04	6,908.70	0.00	0.00	0.00	0.00	0.00	0.00	0.00
17-Mar-04	6,915.80	0.00	0.00	0.00	0.00	0.00	0.00	0.00
18-Mar-04	6,906.30	0.00	0.00	0.00	0.00	0.00	0.00	0.00
19-Mar-04	6,817.39	0.00	45.65	22.66	0.00	0.00	0.00	0.00
20-Mar-04	6,709.60	0.00	0.00	0.00	0.00	0.00	0.00	0.00
21-Mar-04	6,830.10	0.00	0.00	0.00	0.00	0.00	0.00	0.00
22-Mar-04	6,724.85	0.00	0.00	22.05	0.00	0.00	0.00	0.00
23-Mar-04	6,604.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
24-Mar-04	6,460.41	0.00	22.21	72.28	0.00	0.00	0.00	0.00
25-Mar-04	6,577.85	0.00	22.39	21.56	0.00	0.00	0.00	0.00
26-Mar-04	6,724.83	0.00	0.00	50.37	0.00	0.00	0.00	0.00
27-Mar-04	6,725.10	0.00	0.00	0.00	0.00	0.00	0.00	0.00
28-Mar-04	6,644.50	0.00	0.00	0.00	0.00	0.00	0.00	0.00
29-Mar-04	6,832.19	0.00	0.00	48.61	0.00	0.00	0.00	0.00
30-Mar-04	6,659.98	0.00	22.37	74.65	0.00	0.00	0.00	0.00
31-Mar-04	6,440.37	0.00	0.00	98.93	0.00	0.00	0.00	0.00
Adjustment	1,200.00							
Total Burned	210,037.66	0.00	268.10	452.24	0.00	0.00	0.00	0.00
Total Delivered	208,077.89	0.00	268.10	452.24	0.00	0.00	0.00	0.00
HHV	8556	0	15000	7187	16932	0	0	0
% Ash	4.69%	0.00%	7.05%	1.10%	0.00%	0.00%	0.00%	0.00%
Tons Ash	9,840.55	0.00	18.90	4.97	0.00	0.00	0.00	0.00

BIG STONE PLANT
FUEL BURN RECORD - page 1
Apr-04

DATE	Coal	P. Coke	TDF	Waste Seeds	Toner	Gran. Insul.	Canvas Belting	Plastic Chips
	(Tons)	(Tons)	(Tons)	(Tons)	(Tons)	(Tons)	(Tons)	(Tons)
1-Apr-04	6,572.48	0.00	22.84	98.88	0.00	0.00	0.00	0.00
2-Apr-04	6,711.45	0.00	22.17	46.78	0.00	0.00	0.00	0.00
3-Apr-04	5,523.70	0.00	0.00	0.00	0.00	0.00	0.00	0.00
4-Apr-04	6,039.50	0.00	0.00	0.00	0.00	0.00	0.00	0.00
5-Apr-04	6,139.72	0.00	0.00	98.68	0.00	0.00	0.00	0.00
6-Apr-04	6,472.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
7-Apr-04	6,481.63	0.00	22.40	119.97	0.00	0.00	0.00	0.00
8-Apr-04	6,613.32	0.00	0.00	95.68	0.00	0.00	0.00	0.00
9-Apr-04	6,665.89	0.00	0.00	26.51	0.00	0.00	0.00	0.00
10-Apr-04	6,709.50	0.00	0.00	0.00	0.00	0.00	0.00	0.00
11-Apr-04	6,726.60	0.00	0.00	0.00	0.00	0.00	0.00	0.00
12-Apr-04	6,358.18	0.00	0.00	97.32	0.00	0.00	0.00	0.00
13-Apr-04	5,728.55	0.00	0.00	93.85	0.00	0.00	0.00	0.00
14-Apr-04	6,138.60	0.00	0.00	49.20	0.00	0.00	0.00	0.00
15-Apr-04	6,302.95	0.00	22.39	24.06	0.00	0.00	0.00	0.00
16-Apr-04	6,532.74	0.00	0.00	50.06	0.00	0.00	0.00	0.00
17-Apr-04	6,463.50	0.00	0.00	0.00	0.00	0.00	0.00	0.00
18-Apr-04	6,499.80	0.00	0.00	0.00	0.00	0.00	0.00	0.00
19-Apr-04	6,689.10	0.00	0.00	0.00	0.00	0.00	0.00	0.00
20-Apr-04	6,659.43	0.00	22.27	0.00	0.00	0.00	0.00	0.00
21-Apr-04	6,591.09	0.00	0.00	21.81	0.00	0.00	0.00	0.00
22-Apr-04	6,803.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
23-Apr-04	6,680.40	0.00	0.00	0.00	0.00	0.00	0.00	0.00
24-Apr-04	323.90	0.00	0.00	0.00	0.00	0.00	0.00	0.00
25-Apr-04	5,039.90	0.00	0.00	0.00	0.00	0.00	0.00	0.00
26-Apr-04	6,479.74	0.00	67.77	70.49	0.00	0.00	0.00	0.00
27-Apr-04	6,604.44	0.00	22.79	47.97	0.00	0.00	0.00	0.00
28-Apr-04	6,163.60	0.00	0.00	0.00	0.00	0.00	0.00	0.00
29-Apr-04	6,644.04	0.00	0.00	15.36	0.00	0.00	0.00	0.00
30-Apr-04	6,537.30	0.00	0.00	24.30	0.00	0.00	0.00	0.00
Adjustment	0.00							
Total Burned	185,896.05	0.00	202.63	980.92	0.00	0.00	0.00	0.00
Total Delivered	196,186.76	0.00	202.63	980.92	0.00	0.00	0.00	0.00
HHV	8597	0	15000	7187	16932	0	0	0
% Ash	4.66%	0.00%	7.05%	1.10%	0.00%	0.00%	0.00%	0.00%
Tons Ash	8,658.66	0.00	14.29	10.79	0.00	0.00	0.00	0.00

BIG STONE PLANT
FUEL BURN RECORD - page 1
May-04

DATE	Coal	P. Coke	TDF	Waste Seeds	Toner	Gran. Insul.	Canvas Belting	Plastic Chips
	(Tons)	(Tons)	(Tons)	(Tons)	(Tons)	(Tons)	(Tons)	(Tons)
1-May-04	6,511.50	0.00	0.00	0.00	0.00	0.00	0.00	0.00
2-May-04	6,541.20	0.00	0.00	0.00	0.00	0.00	0.00	0.00
3-May-04	6,625.78	0.00	22.32	0.00	0.00	0.00	0.00	0.00
4-May-04	6,576.44	0.00	0.00	12.36	0.00	0.00	0.00	0.00
5-May-04	6,465.51	0.00	47.67	25.02	0.00	0.00	0.00	0.00
6-May-04	6,430.19	0.00	91.98	42.23	0.00	0.00	0.00	0.00
7-May-04	6,415.21	0.00	140.49	0.00	0.00	0.00	0.00	0.00
8-May-04	6,550.20	0.00	0.00	0.00	0.00	0.00	0.00	0.00
9-May-04	6,401.10	0.00	0.00	0.00	0.00	0.00	0.00	0.00
10-May-04	6,421.90	0.00	120.00	20.00	0.00	0.00	0.00	0.00
11-May-04	6,416.10	0.00	80.00	40.00	0.00	0.00	0.00	0.00
12-May-04	6,307.01	0.00	160.00	63.99	0.00	0.00	0.00	0.00
13-May-04	6,222.38	0.00	193.12	0.00	0.00	0.00	0.00	0.00
14-May-04	6,285.18	0.00	173.71	24.51	0.00	0.00	0.00	0.00
15-May-04	6,443.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
16-May-04	6,479.80	0.00	0.00	0.00	0.00	0.00	0.00	0.00
17-May-04	6,494.54	0.00	0.00	90.46	0.00	0.00	0.00	0.00
18-May-04	6,658.36	0.00	73.93	47.71	0.00	0.00	0.00	0.00
19-May-04	6,398.58	0.00	71.60	23.52	0.00	0.00	0.00	0.00
20-May-04	6,723.50	0.00	0.00	0.00	0.00	0.00	0.00	0.00
21-May-04	6,680.82	0.00	49.89	44.49	0.00	0.00	0.00	0.00
22-May-04	6,840.70	0.00	0.00	0.00	0.00	0.00	0.00	0.00
23-May-04	6,770.40	0.00	0.00	0.00	0.00	0.00	0.00	0.00
24-May-04	6,602.04	0.00	122.04	63.12	0.00	0.00	0.00	0.00
25-May-04	6,529.43	0.00	71.65	98.32	0.00	0.00	0.00	0.00
26-May-04	6,681.67	0.00	49.55	71.88	0.00	0.00	0.00	0.00
27-May-04	6,939.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
28-May-04	6,406.92	0.00	47.13	69.95	0.00	0.00	0.00	0.00
29-May-04	6,233.80	0.00	0.00	0.00	0.00	0.00	0.00	0.00
30-May-04	6,376.20	0.00	0.00	0.00	0.00	0.00	0.00	0.00
31-May-04	6,279.80	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Adjustment	2,000.00							
Total Burned	203,708.26	0.00	1,515.08	737.56	0.00	0.00	0.00	0.00
Total Delivered	211,380.43	0.00	1,515.08	737.56	0.00	0.00	0.00	0.00
HHV	8545	0	15000	7187	16932	0	0	0
% Ash	4.54%	0.00%	7.05%	1.10%	0.00%	0.00%	0.00%	0.00%
Tons Ash	9,256.53	0.00	106.81	8.11	0.00	0.00	0.00	0.00

BIG STONE PLANT
FUEL BURN RECORD - page 1
Jun-04

DATE	Coal	P. Coke	TDF	Waste Seeds	Toner	Gran. Insul.	Canvas Belting	Plastic Chips
	(Tons)	(Tons)	(Tons)	(Tons)	(Tons)	(Tons)	(Tons)	(Tons)
1-Jun-04	6,214.61	0.00	52.18	70.31	0.00	0.00	0.00	0.00
2-Jun-04	6,324.20	0.00	47.41	94.19	0.00	0.00	0.00	0.00
3-Jun-04	6,255.10	0.00	0.00	0.00	0.00	0.00	0.00	0.00
4-Jun-04	4,258.30	0.00	0.00	0.00	0.00	0.00	0.00	0.00
5-Jun-04	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
6-Jun-04	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
7-Jun-04	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
8-Jun-04	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
9-Jun-04	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
10-Jun-04	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
11-Jun-04	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
12-Jun-04	212.10	0.00	0.00	0.00	0.00	0.00	0.00	0.00
13-Jun-04	5,015.60	0.00	0.00	0.00	0.00	0.00	0.00	0.00
14-Jun-04	6,189.40	0.00	0.00	0.00	0.00	0.00	0.00	0.00
15-Jun-04	6,332.30	0.00	0.00	0.00	0.00	0.00	0.00	0.00
16-Jun-04	6,056.08	0.00	173.21	66.81	0.00	0.00	0.00	0.00
17-Jun-04	5,931.45	0.00	129.99	117.56	0.00	0.00	0.00	0.00
18-Jun-04	5,969.10	0.00	100.00	0.00	0.00	0.00	0.00	0.00
19-Jun-04	5,670.96	0.00	100.34	0.00	0.00	0.00	0.00	0.00
20-Jun-04	5,428.40	0.00	0.00	0.00	0.00	0.00	0.00	0.00
21-Jun-04	5,776.89	0.00	93.49	22.22	0.00	0.00	0.00	0.00
22-Jun-04	5,786.29	0.00	73.01	23.10	0.00	0.00	0.00	0.00
23-Jun-04	6,311.23	0.00	155.07	0.00	0.00	0.00	0.00	0.00
24-Jun-04	6,567.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
25-Jun-04	6,269.60	0.00	122.46	39.14	0.00	0.00	0.00	0.00
26-Jun-04	5,793.10	0.00	100.00	0.00	0.00	0.00	0.00	0.00
27-Jun-04	5,242.00	0.00	100.00	0.00	0.00	0.00	0.00	0.00
28-Jun-04	5,978.85	0.00	96.97	44.18	0.00	0.00	0.00	0.00
29-Jun-04	6,439.56	0.00	95.02	49.52	0.00	0.00	0.00	0.00
30-Jun-04	6,402.20	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Adjustment	6,000.00							
Burned	136,424.32	0.00	1,439.15	527.03	0.00	0.00	0.00	0.00
Delivered	126,893.93	0.00	1,439.15	527.03	0.00	0.00	0.00	0.00
HHV	8460	0	15000	7187	0	0	0	0
% Ash	4.85%	0.00%	7.04%	1.10%	0.00%	0.00%	0.00%	0.00%
Tons Ash	6,611.92	0.00	101.32	5.80	0.00	0.00	0.00	0.00

BIG STONE PLANT
FUEL BURN RECORD
Jul-04

DATE	Coal	P. Coke	TDF	Waste Seeds	Toner	Gran. Insul.	Canvas Belting	Plastic Chips
	(Tons)	(Tons)	(Tons)	(Tons)	(Tons)	(Tons)	(Tons)	(Tons)
1-Jul-04	6,323.90	0.00	100.00	50.00	0.00	0.00	0.00	0.00
2-Jul-04	6,323.30	0.00	0.00	0.00	0.00	0.00	0.00	0.00
3-Jul-04	6,242.40	0.00	0.00	0.00	0.00	0.00	0.00	0.00
4-Jul-04	5,693.70	0.00	0.00	0.00	0.00	0.00	0.00	0.00
5-Jul-04	5,543.60	0.00	0.00	0.00	0.00	0.00	0.00	0.00
6-Jul-04	5,800.15	0.00	204.45	0.00	0.00	0.00	0.00	0.00
7-Jul-04	5,671.74	0.00	337.24	46.22	0.00	0.00	0.00	0.00
8-Jul-04	6,278.89	0.00	96.51	0.00	0.00	0.00	0.00	0.00
9-Jul-04	6,627.10	0.00	120.00	0.00	0.00	0.00	0.00	0.00
10-Jul-04	6,285.25	0.00	238.85	0.00	0.00	0.00	0.00	0.00
11-Jul-04	6,516.90	0.00	0.00	0.00	0.00	0.00	0.00	0.00
12-Jul-04	6,353.47	0.00	178.48	23.85	0.00	0.00	0.00	0.00
13-Jul-04	6,485.70	0.00	0.00	0.00	0.00	0.00	0.00	0.00
14-Jul-04	1,885.26	0.00	241.72	200.62	0.00	0.00	0.00	0.00
15-Jul-04	226.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
16-Jul-04	5,979.42	0.00	24.28	108.20	0.00	0.00	0.00	0.00
17-Jul-04	6,389.10	0.00	0.00	0.00	0.00	0.00	0.00	0.00
18-Jul-04	6,355.80	0.00	0.00	0.00	0.00	0.00	0.00	0.00
19-Jul-04	6,668.89	0.00	0.00	1.41	0.00	0.00	0.00	0.00
20-Jul-04	1,182.08	0.00	283.22	0.00	0.00	0.00	0.00	0.00
21-Jul-04	4,228.47	0.00	46.03	0.00	0.00	0.00	0.00	0.00
22-Jul-04	4,591.20	0.00	0.00	0.00	0.00	0.00	0.00	0.00
23-Jul-04	3,457.68	0.00	67.66	28.96	0.00	0.00	0.00	0.00
24-Jul-04	5,654.10	0.00	0.00	0.00	0.00	0.00	0.00	0.00
25-Jul-04	6,003.20	0.00	0.00	0.00	0.00	0.00	0.00	0.00
26-Jul-04	6,478.26	0.00	114.84	0.00	0.00	0.00	0.00	0.00
27-Jul-04	5,665.82	0.00	167.56	22.62	0.00	0.00	0.00	0.00
28-Jul-04	5,909.31	0.00	192.29	0.00	0.00	0.00	0.00	0.00
29-Jul-04	5,944.37	0.00	167.73	0.00	0.00	0.00	0.00	0.00
30-Jul-04	5,799.51	0.00	167.09	0.00	0.00	0.00	0.00	0.00
31-Jul-04	5,802.20	0.00	200.00	0.00	0.00	0.00	0.00	0.00
Adjustment	0.00							
Total Burned	168,366.77	0.00	2,947.95	481.88	0.00	0.00	0.00	0.00
Total Delivered	169,731.25	0.00	2,947.95	481.88	0.00	0.00	0.00	0.00
HHV	8485	0	15000	7187	16932	0	0	0
% Ash	4.69%	0.00%	7.04%	1.10%	0.00%	0.00%	0.00%	0.00%
Tons Ash	7,891.06	0.00	207.54	5.30	0.00	0.00	0.00	0.00

BIG STONE PLANT
FUEL BURN RECORD
Aug-04

DATE	Coal	P. Coke	TDF	Waste Seeds	Toner	Gran. Insul.	Canvas Belting	Plastic Chips
	(Tons)	(Tons)	(Tons)	(Tons)	(Tons)	(Tons)	(Tons)	(Tons)
1-Aug-04	6,220.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
2-Aug-04	6,231.90	0.00	0.00	0.00	0.00	0.00	0.00	0.00
3-Aug-04	5,820.97	0.00	390.29	136.84	0.00	0.00	0.00	0.00
4-Aug-04	6,242.70	0.00	0.00	25.70	0.00	0.00	0.00	0.00
5-Aug-04	6,234.70	0.00	0.00	0.00	0.00	0.00	0.00	0.00
6-Aug-04	5,599.51	0.00	339.47	118.52	0.00	0.00	0.00	0.00
7-Aug-04	5,872.30	0.00	0.00	0.00	0.00	0.00	0.00	0.00
8-Aug-04	5,721.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
9-Aug-04	5,845.91	0.00	72.77	25.52	0.00	0.00	0.00	0.00
10-Aug-04	5,937.55	0.00	22.74	40.11	0.00	0.00	0.00	0.00
11-Aug-04	6,328.43	0.00	47.17	25.60	0.00	0.00	0.00	0.00
12-Aug-04	5,994.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
13-Aug-04	5,787.90	0.00	0.00	0.00	0.00	0.00	0.00	0.00
14-Aug-04	6,140.30	0.00	0.00	0.00	0.00	0.00	0.00	0.00
15-Aug-04	5,627.30	0.00	0.00	0.00	0.00	0.00	0.00	0.00
16-Aug-04	5,906.56	0.00	385.16	46.98	0.00	0.00	0.00	0.00
17-Aug-04	6,298.44	0.00	95.76	23.30	0.00	0.00	0.00	0.00
18-Aug-04	5,785.59	0.00	267.51	0.00	0.00	0.00	0.00	0.00
19-Aug-04	6,209.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
20-Aug-04	2,457.97	0.00	338.43	43.70	0.00	0.00	0.00	0.00
21-Aug-04	3,093.40	0.00	0.00	0.00	0.00	0.00	0.00	0.00
22-Aug-04	4,551.70	0.00	0.00	0.00	0.00	0.00	0.00	0.00
23-Aug-04	6,236.43	0.00	23.07	0.00	0.00	0.00	0.00	0.00
24-Aug-04	6,099.90	0.00	0.00	0.00	0.00	0.00	0.00	0.00
25-Aug-04	6,431.44	0.00	290.16	0.00	0.00	0.00	0.00	0.00
26-Aug-04	6,665.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
27-Aug-04	6,543.40	0.00	100.00	0.00	0.00	0.00	0.00	0.00
28-Aug-04	6,302.70	0.00	100.00	0.00	0.00	0.00	0.00	0.00
29-Aug-04	4,930.14	0.00	85.86	0.00	0.00	0.00	0.00	0.00
30-Aug-04	5,939.43	0.00	46.97	0.00	0.00	0.00	0.00	0.00
31-Aug-04	6,046.79	0.00	22.41	0.00	0.00	0.00	0.00	0.00
Adjustment	0.00							
Total Burned	179,102.36	0.00	2,627.77	486.27	0.00	0.00	0.00	0.00
Total Delivered	180,630.08	0.00	2,627.77	486.27	0.00	0.00	0.00	0.00
HHV	8474	0	15000	7187	0	0	0	0
% Ash	5.13%	0.00%	7.04%	1.10%	0.00%	0.00%	0.00%	0.00%
Tons Ash	9,195.57	0.00	185.00	5.35	0.00	0.00	0.00	0.00

BIG STONE PLANT
FUEL BURN RECORD
Sep-04

DATE	Coal	P. Coke	TDF	Waste Seeds	Toner	Gran. Insul.	Canvas Belting	Plastic Chips
	(Tons)	(Tons)	(Tons)	(Tons)	(Tons)	(Tons)	(Tons)	(Tons)
1-Sep-04	6,415.74	0.00	49.66	0.00	0.00	0.00	0.00	0.00
2-Sep-04	6,272.30	0.00	0.00	0.00	0.00	0.00	0.00	0.00
3-Sep-04	6,031.55	0.00	271.96	47.39	0.00	0.00	0.00	0.00
4-Sep-04	6,516.50	0.00	0.00	0.00	0.00	0.00	0.00	0.00
5-Sep-04	6,409.60	0.00	0.00	0.00	0.00	0.00	0.00	0.00
6-Sep-04	5,961.40	0.00	0.00	0.00	0.00	0.00	0.00	0.00
7-Sep-04	5,785.95	0.00	240.93	45.12	0.00	0.00	0.00	0.00
8-Sep-04	5,927.20	0.00	0.00	0.00	0.00	0.00	0.00	0.00
9-Sep-04	6,066.87	0.00	192.03	0.00	0.00	0.00	0.00	0.00
10-Sep-04	6,162.54	0.00	191.46	0.00	0.00	0.00	0.00	0.00
11-Sep-04	6,462.20	0.00	0.00	0.00	0.00	0.00	0.00	0.00
12-Sep-04	6,045.30	0.00	0.00	0.00	0.00	0.00	0.00	0.00
13-Sep-04	5,949.24	0.00	187.26	0.00	0.00	0.00	0.00	0.00
14-Sep-04	6,353.24	0.00	172.26	0.00	0.00	0.00	0.00	0.00
15-Sep-04	6,226.68	0.00	299.12	0.00	0.00	0.00	0.00	0.00
16-Sep-04	6,022.77	0.00	122.53	0.00	0.00	0.00	0.00	0.00
17-Sep-04	6,325.42	0.00	140.45	46.43	0.00	0.00	0.00	0.00
18-Sep-04	6,686.60	0.00	0.00	0.00	0.00	0.00	0.00	0.00
19-Sep-04	6,205.90	0.00	0.00	0.00	0.00	0.00	0.00	0.00
20-Sep-04	6,315.21	0.00	158.07	26.12	0.00	0.00	0.00	0.00
21-Sep-04	6,352.20	0.00	0.00	0.00	0.00	0.00	0.00	0.00
22-Sep-04	6,701.10	0.00	0.00	0.00	0.00	0.00	0.00	0.00
23-Sep-04	6,808.50	0.00	0.00	0.00	0.00	0.00	0.00	0.00
24-Sep-04	6,453.00	0.00	146.90	0.00	0.00	0.00	0.00	0.00
25-Sep-04	6,275.80	0.00	100.00	0.00	0.00	0.00	0.00	0.00
26-Sep-04	5,974.60	0.00	100.00	0.00	0.00	0.00	0.00	0.00
27-Sep-04	3,991.58	0.00	45.42	0.00	0.00	0.00	0.00	0.00
28-Sep-04	443.90	0.00	0.00	0.00	0.00	0.00	0.00	0.00
29-Sep-04	6,174.22	0.00	94.58	0.00	0.00	0.00	0.00	0.00
30-Sep-04	6,337.12	0.00	95.08	0.00	0.00	0.00	0.00	0.00
Adjustment	-1,500.00							
Total Burned	178,154.23	0.00	2,607.71	165.06	0.00	0.00	0.00	0.00
Total Delivered	181,803.11	0.00	2,607.71	165.06	0.00	0.00	0.00	0.00
HHV	8506	0	15000	7187	0	0	0	0
% Ash	4.66%	0.00	7.04%	1.10%	0.00%	0.00%	0.00%	0.00%
Tons Ash	8,302.79	0.00	51.48	12.52	0.00	0.00	0.00	0.00

BIG STONE PLANT
FUEL BURN RECORD
Oct-04

DATE	Coal	P. Coke	TDF	Waste Seeds	Toner	Gran. Insul.	Canvas Belting	Plastic Chips
	(Tons)	(Tons)	(Tons)	(Tons)	(Tons)	(Tons)	(Tons)	(Tons)
1-Oct-04	6,130.30	0.00	200.00	0.00	0.00	0.00	0.00	0.00
2-Oct-04	6,031.00	0.00	200.00	0.00	0.00	0.00	0.00	0.00
3-Oct-04	6,217.15	0.00	143.65	0.00	0.00	0.00	0.00	0.00
4-Oct-04	6,171.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
5-Oct-04	6,385.43	0.00	166.07	0.00	0.00	0.00	0.00	0.00
6-Oct-04	6,571.88	0.00	47.42	0.00	0.00	0.00	0.00	0.00
7-Oct-04	6,634.81	0.00	45.69	0.00	0.00	0.00	0.00	0.00
8-Oct-04	6,408.54	0.00	193.26	0.00	0.00	0.00	0.00	0.00
9-Oct-04	6,794.10	0.00	0.00	0.00	0.00	0.00	0.00	0.00
10-Oct-04	6,057.80	0.00	0.00	0.00	0.00	0.00	0.00	0.00
11-Oct-04	6,502.70	0.00	0.00	0.00	0.00	0.00	0.00	0.00
12-Oct-04	6,675.90	0.00	0.00	0.00	0.00	0.00	0.00	0.00
13-Oct-04	6,585.30	0.00	0.00	0.00	0.00	0.00	0.00	0.00
14-Oct-04	6,638.40	0.00	0.00	0.00	0.00	0.00	0.00	0.00
15-Oct-04	5,361.65	0.00	789.23	70.52	0.00	0.00	0.00	0.00
16-Oct-04	6,483.40	0.00	0.00	0.00	0.00	0.00	0.00	0.00
17-Oct-04	6,468.40	0.00	0.00	0.00	0.00	0.00	0.00	0.00
18-Oct-04	6,409.92	0.00	23.38	0.00	0.00	0.00	0.00	0.00
19-Oct-04	6,596.53	0.00	44.87	0.00	0.00	0.00	0.00	0.00
20-Oct-04	6,507.18	0.00	68.82	0.00	0.00	0.00	0.00	0.00
21-Oct-04	6,512.10	0.00	0.00	0.00	0.00	0.00	0.00	0.00
22-Oct-04	5,183.16	0.00	46.24	0.00	0.00	0.00	0.00	0.00
23-Oct-04	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
24-Oct-04	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
25-Oct-04	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
26-Oct-04	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
27-Oct-04	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
28-Oct-04	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
29-Oct-04	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
30-Oct-04	2,415.80	0.00	0.00	0.00	0.00	0.00	0.00	0.00
31-Oct-04	4,298.53	0.00	0.00	45.37	0.00	0.00	0.00	0.00
Adjustment	0.00							
Total Burned	146,040.98	0.00	1,968.63	115.89	0.00	0.00	0.00	0.00
Total Delivered	139,115.98	0.00	1,968.63	115.89	0.00	0.00	0.00	0.00
HHV	8453	0	15000	7187	0	0	0	0
% Ash	4.77%	0.00%	7.04%	1.10%	0.00%	0.00%	0.00%	0.00%
Tons Ash	6,963.15	0.00	51.48	12.52	0.00	0.00	0.00	0.00

BIG STONE PLANT
FUEL BURN RECORD
Nov-04

DATE	Coal	P. Coke	TDF	Waste Seeds	Toner	Gran. Insul.	Canvas Belting	Plastic Chips
	(Tons)	(Tons)	(Tons)	(Tons)	(Tons)	(Tons)	(Tons)	(Tons)
1-Nov-04	6,456.19	0.00	0.00	23.11	0.00	0.00	0.00	0.00
2-Nov-04	6,847.50	0.00	27.60	0.00	0.00	0.00	0.00	0.00
3-Nov-04	6,708.27	0.00	121.74	24.79	0.00	0.00	0.00	0.00
4-Nov-04	6,370.60	0.00	0.00	0.00	0.00	0.00	0.00	0.00
5-Nov-04	6,521.10	0.00	100.00	50.00	0.00	0.00	0.00	0.00
6-Nov-04	6,009.25	0.00	100.00	22.95	0.00	0.00	0.00	0.00
7-Nov-04	6,376.55	0.00	91.75	0.00	0.00	0.00	0.00	0.00
8-Nov-04	6,417.37	0.00	215.61	22.82	0.00	0.00	0.00	0.00
9-Nov-04	6,218.32	0.00	22.59	47.99	0.00	0.00	0.00	0.00
10-Nov-04	6,489.40	0.00	0.00	0.00	0.00	0.00	0.00	0.00
11-Nov-04	6,474.60	0.00	0.00	0.00	0.00	0.00	0.00	0.00
12-Nov-04	6,045.24	0.00	214.64	72.92	0.00	0.00	0.00	0.00
13-Nov-04	6,169.70	0.00	200.00	65.00	0.00	0.00	0.00	0.00
14-Nov-04	5,955.90	0.00	200.00	65.00	0.00	0.00	0.00	0.00
15-Nov-04	6,288.28	0.00	190.31	165.61	0.00	0.00	0.00	0.00
16-Nov-04	6,417.52	0.00	48.24	120.64	0.00	0.00	0.00	0.00
17-Nov-04	6,650.68	0.00	47.43	25.39	0.00	0.00	0.00	0.00
18-Nov-04	6,640.60	0.00	50.00	25.00	0.00	0.00	0.00	0.00
19-Nov-04	6,235.15	0.00	324.85	204.40	0.00	0.00	0.00	0.00
20-Nov-04	6,092.50	0.00	0.00	0.00	0.00	0.00	0.00	0.00
21-Nov-04	6,340.50	0.00	0.00	0.00	0.00	0.00	0.00	0.00
22-Nov-04	6,398.38	0.00	161.30	25.02	0.00	0.00	0.00	0.00
23-Nov-04	6,683.58	0.00	93.60	77.32	0.00	0.00	0.00	0.00
24-Nov-04	6,736.00	0.00	210.00	0.00	0.00	0.00	0.00	0.00
25-Nov-04	6,029.40	0.00	30.00	0.00	0.00	0.00	0.00	0.00
26-Nov-04	6,286.24	0.00	0.00	25.16	0.00	0.00	0.00	0.00
27-Nov-04	6,447.20	0.00	0.00	0.00	0.00	0.00	0.00	0.00
28-Nov-04	6,711.20	0.00	0.00	0.00	0.00	0.00	0.00	0.00
29-Nov-04	6,674.38	0.00	134.27	24.95	0.00	0.00	0.00	0.00
30-Nov-04	6,533.88	0.00	118.67	49.55	0.00	0.00	0.00	0.00
Adjustment	0.00							
Total Burned	192,225.48	0.00	2,702.60	1,137.62	0.00	0.00	0.00	0.00
Total Delivered	179,452.91	0.00	2,702.60	1,137.62	0.00	0.00	0.00	0.00
HHV	8535	0	15000	7187	16932	6500		
% Ash	4.63%	0.00%	7.04%	1.10%	0.00%	0.00%		
Tons Ash	8,899.99	0.00	190.26	12.51	0.00	0.00	0.00	0.00

BIG STONE PLANT
FUEL BURN RECORD - page 1 of 3
Dec-04

DATE	Coal	P. Coke	TDF	Waste Seeds	Toner	Gran. Insul.	Canvas Belting	Plastic Chips
	(Tons)	(Tons)	(Tons)	(Tons)	(Tons)	(Tons)	(Tons)	(Tons)
1-Dec-04	6,677.28	0.00	126.45	73.87	0.00	0.00	0.00	0.00
2-Dec-04	7,045.90	0.00	0.00	0.00	0.00	0.00	0.00	0.00
3-Dec-04	6,664.19	0.00	147.63	100.08	0.00	0.00	0.00	0.00
4-Dec-04	6,638.10	0.00	0.00	0.00	0.00	0.00	0.00	0.00
5-Dec-04	6,724.80	0.00	0.00	0.00	0.00	0.00	0.00	0.00
6-Dec-04	6,484.83	0.00	141.25	26.02	0.00	0.00	0.00	0.00
7-Dec-04	6,873.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
8-Dec-04	6,631.28	0.00	190.00	50.22	0.00	0.00	0.00	0.00
9-Dec-04	6,765.40	0.00	0.00	0.00	0.00	0.00	0.00	0.00
10-Dec-04	6,351.80	0.00	228.32	22.88	0.00	0.00	0.00	0.00
11-Dec-04	6,512.10	0.00	125.00	0.00	0.00	0.00	0.00	0.00
12-Dec-04	6,737.90	0.00	0.00	0.00	0.00	0.00	0.00	0.00
13-Dec-04	6,769.40	0.00	165.91	23.09	0.00	0.00	0.00	0.00
14-Dec-04	6,785.82	0.00	95.48	0.00	0.00	0.00	0.00	0.00
15-Dec-04	6,783.30	0.00	0.00	0.00	0.00	0.00	0.00	0.00
16-Dec-04	6,761.13	0.00	74.93	23.74	0.00	0.00	0.00	0.00
17-Dec-04	6,611.05	0.00	254.18	24.37	0.00	0.00	0.00	0.00
18-Dec-04	6,890.00	0.00	200.00	0.00	0.00	0.00	0.00	0.00
19-Dec-04	6,831.30	0.00	200.00	0.00	0.00	0.00	0.00	0.00
20-Dec-04	6,657.30	0.00	0.00	0.00	0.00	0.00	0.00	0.00
21-Dec-04	6,718.65	0.00	117.58	22.07	0.00	0.00	0.00	0.00
22-Dec-04	6,911.80	0.00	0.00	0.00	0.00	0.00	0.00	0.00
23-Dec-04	6,918.50	0.00	0.00	0.00	0.00	0.00	0.00	0.00
24-Dec-04	6,886.90	0.00	0.00	0.00	0.00	0.00	0.00	0.00
25-Dec-04	6,979.80	0.00	0.00	0.00	0.00	0.00	0.00	0.00
26-Dec-04	6,927.60	0.00	0.00	0.00	0.00	0.00	0.00	0.00
27-Dec-04	6,692.44	0.00	267.76	0.00	0.00	0.00	0.00	0.00
28-Dec-04	5,440.52	0.00	181.78	0.00	0.00	0.00	0.00	0.00
29-Dec-04	6,224.12	0.00	254.10	87.68	0.00	0.00	0.00	0.00
30-Dec-04	6,573.70	0.00	0.00	0.00	0.00	0.00	0.00	0.00
31-Dec-04	6,559.53	0.00	50.27	0.00	0.00	0.00	0.00	0.00
Adjustment	-5,500.00							
Total Burned	201,529.44	0.00	2,820.64	454.02	0.00	0.00	0.00	0.00
Total Delivered	207,087.84	0.00	2,820.64	454.02	0.00	0.00	0.00	0.00
HHV	8532	0	15000	7187	0	0	0	0
% Ash	4.66%	0.00%	7.04%	1.10%	0.00%	0.00%	0.00%	0.00%
Tons Ash	9,388.17	0.00	70.76	23.60	0.00	0.00	0.00	0.00

B15 Fuel Analysis Record

BIG STONE PLANT — COAL ANALYSIS PER TRAIN
Oct-02 — PAGE 1

DATE	TR #	MOIS. %	% ASH AR	HHV AR	S, % AR	% ASH DRY	HHV DRY	S, % DRY	NaO %	MAF HHV	COAL TONS	TONS OK
PREV. MON.												
PREV. MON.												
1-Oct-02	0	0	0	0	0	0	0	0	0	0	0.000	
2-Oct-02	0	0	0	0	0	0	0	0	0	0	0.000	
3-Oct-02	0	0	0	0	0	0	0	0	0	0	0.000	
4-Oct-02	0	0	0	0	0	0	0	0	0	0	0.000	
5-Oct-02	0	0	0	0	0	0	0	0	0	0	0.000	
6-Oct-02	0	0	0	0	0	0	0	0	0	0	0.000	
7-Oct-02	0	0	0	0	0	0	0	0	0	0	0.000	
8-Oct-02	0	0	0	0	0	0	0	0	0	0	0.000	
9-Oct-02	0	0	0	0	0	0	0	0	0	0	0.000	
10-Oct-02	0	0	0	0	0	0	0	0	0	0	0.000	
11-Oct-02	0	0	0	0	0	0	0	0	0	0	0.000	
12-Oct-02	0	0	0	0	0	0	0	0	0	0	0.000	
13-Oct-02	0	0	0	0	0	0	0	0	0	0	0.000	
14-Oct-02	0	0	0	0	0	0	0	0	0	0	0.000	
15-Oct-02	0	0	0	0	0	0	0	0	0	0	0.000	
16-Oct-02	0	0	0	0	0	0	0	0	0	0	0.000	
17-Oct-02	0	0	0	0	0	0	0	0	0	0	0.000	
18-Oct-02	0	0	0	0	0	0	0	0	0	0	0.000	
19-Oct-02	0	0	0	0	0	0	0	0	0	0	0.000	
20-Oct-02	0	0	0	0	0	0	0	0	0	0	0.000	
21-Oct-02	0	0	0	0	0	0	0	0	0	0	0.000	
22-Oct-02	0	0	0	0	0	0	0	0	0	0	0.000	
23-Oct-02	0	0	0	0	0	0	0	0	0	0	0.000	
24-Oct-02	bam75	29.59	4.15	8639	0.27	5.9	12269	0.39	1.49	13038	13008.930	13008.930
25-Oct-02	0	0	0	0	0	0	0	0	0	0	0.000	
26-Oct-02	ebm33	30.44	4.79	8404	0.38	6.89	12081	0.55	1.9	12975	14158.850	14158.850
27-Oct-02	0	0	0	0	0	0	0	0	0	0	0.000	
28-Oct-02	bam76	29.63	4.14	8618	0.26	5.88	12247	0.37	1.42	13012	14061.250	7090.020
29-Oct-02	0	0	0	0	0	0	0	0	0	0	0.000	
30-Oct-02	0	0	0	0	0	0	0	0	0	0	0.000	
31-Oct-02	ebm34	29.98	4.87	8462	0.41	6.96	12085	0.59	1.86	12989	12962.025	
ADJ.												34257.800
											Tons. OK	34257.800
Weighted Average		29.95	4.41	8538	0.31	6.31	12187	0.45	1.64		Burn	34257.800

Monthly Mercury Analysis

Train #	Sample #	% Moist.	Mercury ug/g dry basis	Chlor. ug/g

BIG STONE PLANT COAL ANALYSIS PER TRAIN
Nov-02 PAGE 1

DATE	TR #	MOIS. %	% ASH AR	HHV AR	S, % AR	% ASH DRY	HHV DRY	S, % DRY	NaO %	MAF HHV	COAL TONS	TONS OK
PREV. MON	bam76	29.63	4.14	8618	0.26	5.88	12247	0.37	1.4	13012	14061.25	10256.72
PREV. MON	ebm34	29.98	4.87	8462	0.41	6.96	12085	0.59	1.86	12989	12962.03	12962.03
1-Nov-02	0	0	0	0	0	0	0	0	0	0	0.00	
2-Nov-02	0	0	0	0	0	0	0	0	0	0	0.00	
3-Nov-02	crm01	30.09	5.03	8464	0.32	5.03	12106	0.46	1.1	13045	14143.18	14143.18
4-Nov-02	0	0	0	0	0	0	0	0	0	0	0.00	0.00
5-Nov-02	ebm35	30.36	4.75	8429	0.38	6.82	12103	0.54	1.9	12989	12205.48	12205.48
6-Nov-02	0	0	0	0	0	0	0	0	0	0	0.00	0.00
7-Nov-02	cdm01	28.79	5.93	8501	0.34	8.32	11939	0.41	1.3	13023	12960.60	12960.60
8-Nov-02	0	0	0	0	0	0	0	0	0	0	0.00	0.00
9-Nov-02	ebm36	29.86	4.83	8479	0.39	6.88	12088	0.56	1.8	12981	14098.98	14098.98
10-Nov-02	0	0	0	0	0	0	0	0	0	0	0.00	0.00
11-Nov-02	bam 77	29.51	4.88	8512	0.3	6.93	12076	0.42	1.4	12975	12795.68	12795.68
12-Nov-02	0	0	0	0	0	0	0	0	0	0	0.00	0.00
13-Nov-02	0	0	0	0	0	0	0	0	0	0	0.00	0.00
14-Nov-02	bam78	29.8	4.75	8589	0.31	6.76	12235	0.44	1.4	13122	14128.18	14128.18
15-Nov-02	0	0	0	0	0	0	0	0	0	0	0.00	0.00
16-Nov-02	bam79	29.86	4.1	8601	0.27	5.85	12262	0.38	1.6	13024	14043.63	14043.63
17-Nov-02	0	0	0	0	0	0	0	0	0	0	0.00	0.00
18-Nov-02	bam80	29.36	4.53	8629	0.29	6.41	12215	0.41	1.5	13052	13470.35	13470.35
19-Nov-02	0	0	0	0	0	0	0	0	0	0	0.00	0.00
20-Nov-02	bam81	29.53	4.64	8549	0.28	6.58	12132	0.4	1.4	12987	13204.80	13204.80
21-Nov-02	0	0	0	0	0	0	0	0	0	0	0.00	0.00
22-Nov-02	bam82	29.85	4.74	8466	0.29	6.75	12069	0.41	1.4	12943	14150.85	14150.85
23-Nov-02	0	0	0	0	0	0	0	0	0	0	0.00	0.00
24-Nov-02	bam83	29.29	4.46	8641	0.3	6.31	12221	0.42	1.5	13044	12727.63	12727.63
25-Nov-02	0	0	0	0	0	0	0	0	0	0	0.00	
26-Nov-02	bam84	29.72	4.41	8560	0.25	6.27	12180	0.36	1.5	12995	12724.88	12724.88
27-Nov-02	0	0	0	0	0	0	0	0	0	0	0.00	
28-Nov-02	ebm037	30.13	4.76	8456	0.42	6.81	12102	0.6	1.9	12986	13889.23	521.79
29-Nov-02	0	0	0	0	0	0	0	0	0	0	0.00	
30-Nov-02	crm02	29.37	5.62	8464	0.3	7.96	11982	0.42	1.2	13019	13825.90	
ADJ.												184394.76
											Tons. OK	184394.76
Weighted Average		29.69	4.73	8534	0.31	6.55	12139	0.44	1.50		Burn	184394.76

Monthly Mercury Analysis

Train #	Sample #	% Moist.	Mercury ug/g dry basis	Chlor. ug/g
	C2489	30.15	0.11	<0.01

BIG STONE PLANT COAL ANALYSIS PER TRAIN
Dec-02 PAGE 1

DATE	TR #	MOIS %	ASH AR	HHV AR	S, % AR	% ASH DRY	HHV DRY	S, % DRY	NaO %	MAF HHV	COAL TONS	TONS OK
PREV. MON	ebm037	30.13	4.76	8456	0.42	6.81	12102	0.60	1.92	12986	13889.23	13367.44
PREV. MON	crm02	29.37	5.62	8464	0.30	7.96	11982	0.42	1.17	13019	13825.90	13825.90
1-Dec-02	0	0	0	0	0	0	0	0	0	0	0.00	
2-Dec-02	bam85	30.3	4.26	8530	0.29	6.11	12234	0.42	1.49	13030	10461.98	10461.98
3-Dec-02	0	0	0	0	0	0	0	0	0	0	0.00	
4-Dec-02	0	0	0	0	0	0	0	0	0	0	0.00	
5-Dec-02	crm03	30.8	5.21	8348	0.28	7.53	12055	0.4	1.21	13037	11797.38	11797.38
6-Dec-02	bam86	29.3	4.37	8658	0.25	6.18	12253	0.35	1.56	13060	14086.78	14086.78
7-Dec-02	0	0	0	0	0	0	0	0	0	0	0.00	
8-Dec-02	bam87	29.9	4.53	8554	0.33	6.47	12205	0.47	1.43	13049	13267.00	13267.00
9-Dec-02	0	0	0	0	0	0	0	0	0	0	0.00	
10-Dec-02	bam88	29.9	4.6	8565	0.29	6.57	12220	0.42	1.45	13079	14101.13	14101.13
11-Dec-02	0	0	0	0	0	0	0	0	0	0	0.00	
12-Dec-02	bam89	29.4	4.32	8653	0.27	6.12	12255	0.38	1.49	13054	13264.00	13264.00
13-Dec-02	0	0	0	0	0	0	0	0	0	0	0.00	
14-Dec-02	bam90	30.3	4.23	8537	0.26	6.07	12247	0.38	1.42	13038	14113.73	14113.73
15-Dec-02	0	0	0	0	0	0	0	0	0	0	0.00	
16-Dec-02	0	0	0	0	0	0	0	0	0	0	0.00	
17-Dec-02	bam91	29.1	4.56	8672	0.33	6.43	12225	0.46	1.44	13065	13722.10	13722.10
18-Dec-02	0	0	0	0	0	0	0	0	0	0	0.00	
19-Dec-02	bam92	28.7	4.28	8729	0.26	6	12238	0.36	1.4	13019	14141.13	14141.13
20-Dec-02	0	0	0	0	0	0	0	0	0	0	0.00	
21-Dec-02	0	0	0	0	0	0	0	0	0	0	0.00	
22-Dec-02	0	0	0	0	0	0	0	0	0	0	0.00	
23-Dec-02	ebm38	30.2	5	8396	0.37	7.17	12028	0.53	1.71	12957	14159.77	14159.77
24-Dec-02	0	0	0	0	0	0	0	0	0	0	0.00	
25-Dec-02	0	0	0	0	0	0	0	0	0	0	0.00	
26-Dec-02	0	0	0	0	0	0	0	0	0	0	0.00	
27-Dec-02	ebm39	30.4	4.85	8381	0.4	6.97	12043	0.57	1.81	12945	13929.20	13929.20
28-Dec-02	0	0	0	0	0	0	0	0	0	0	0.00	
29-Dec-02	bam93	28.6	4.45	8712	0.31	6.24	12208	0.44	1.29	13020	14053.55	9182.78
30-Dec-02	ebm40	30	4.76	8457	0.42	6.79	12073	0.6	1.93	12952	13881.20	0.00
31-Dec-02	0	0	0	0	0	0	0	0	0	0	14145.23	
ADJ.												183420.32
											Tons. OK	196553.92
Weighted Average		29.78	4.71	8533	0.31	6.71	12151	0.44	1.49		Burn	196553.92

Monthly Mercury Analysis

Train #	Sample #	% Moist.	Mercury ug/g dry basis	Chlor. ug/g

BIG STONE PLANT COAL ANALYSIS PER TRAIN
Jan-03 PAGE 1

DATE	TR #	MOIS. %	% ASH AR	HHV AR	S, % AR	% ASH DRY	HHV DRY	S, % DRY	NaO %	MAF HHV	COAL TONS	TONS OK
PREV. MO	bam93	28.64	4.45	8712	0.31	6.24	12208	0.44	1.29	13020	14,053.55	4,870.77
PREV. MO	ebm40	29.95	4.76	8457	0.42	6.79	12073	0.60	1.93	12952	13,881.20	13,881.20
1-Jan-03	0	0	0	0	0	0	0	0	0	0	0.00	0.00
2-Jan-03	ebm41	30.52	4.72	8364	0.41	6.79	12038	0.59	1.85	12915	14145.23	14,145.23
3-Jan-03	0	0	0	0	0	0	0	0	0	0	0.00	0.00
4-Jan-03	ebm01	29.97	4.85	8453	0.44	6.92	12071	0.63	1.8	12968	13,092.48	13,092.48
5-Jan-03	0	0	0	0	0	0	0	0	0	0	0.00	0.00
6-Jan-03	bam01	29.52	4.24	8614	0.27	6.02	12222	0.38	1.52	13005	14,090.35	14,090.35
7-Jan-03	0	0	0	0	0	0	0	0	0	0	0.00	0.00
8-Jan-03	bam02	29.26	4.37	8658	0.28	6.18	12239	0.4	1.35	13045	13,033.90	13,033.90
9-Jan-03	0	0	0	0	0	0	0	0	0	0	0.00	0.00
10-Jan-03	bam03	29.42	4.26	8688	0.25	6.03	12310	0.35	1.52	13100	11,730.45	11,730.45
11-Jan-03	0	0	0	0	0	0	0	0	0	0	0.00	0.00
12-Jan-03	bam04	29.5	4.39	8616	0.3	6.23	12221	0.42	1.48	13033	14,159.78	14,159.78
13-Jan-03	0	0	0	0	0	0	0	0	0	0	0.00	0.00
14-Jan-03	bam05	29.01	4.64	8640	0.29	6.53	12171	0.41	1.42	13021	9,762.10	9,762.10
15-Jan-03	0	0	0	0	0	0	0	0	0	0	0.00	0.00
16-Jan-03	bam06	29.01	4.64	8640	0.29	6.53	12171	0.41	1.42	13021	12,282.20	12,282.20
17-Jan-03	0	0	0	0	0	0	0	0	0	0	0.00	0.00
18-Jan-03	0	0	0	0	0	0	0	0	0	0	0.00	0.00
19-Jan-03	bam07	29.13	4.69	8678	0.3	6.62	12245	0.43	1.33	13113	13,522.30	13,522.30
20-Jan-03	bam08	29.62	4.44	8621	0.27	6.31	12249	0.38	1.46	13074	12,037.80	12,037.80
21-Jan-03	0	0	0	0	0	0	0	0	0	0	0.00	0.00
22-Jan-03	0	0	0	0	0	0	0	0	0	0	0.00	0.00
23-Jan-03	0	0	0	0	0	0	0	0	0	0	0.00	0.00
24-Jan-03	bam09	29.83	4.24	8629	0.26	6.04	12297	0.37	1.56	13087	13,318.28	13,318.28
25-Jan-03	bam10	29.95	4.43	8569	0.27	6.32	12233	0.39	1.5	13058	13,531.75	13,531.75
26-Jan-03	0	0	0	0	0	0	0	0	0	0	0.00	0.00
27-Jan-03	0	0	0	0	0	0	0	0	0	0	0.00	0.00
28-Jan-03	0	0	0	0	0	0	0	0	0	0	0.00	0.00
29-Jan-03	bam11	29.28	4.27	8704	0.28	6.04	12308	0.39	1.38	13099	13,322.95	12,958.34
30-Jan-03	bam12	29.85	4.42	8593	0.27	6.3	12250	0.39	1.42	13074	13,171.28	0.00
31-Jan-03	0	0	0	0	0	0	0	0	0	0	0.00	0.00
ADJ.												186,416.92
											Tons. OK	186,416.92
Weighted Average		29.57	4.49	8595	0.31	6.38	12202	0.44	1.54		Burn	186,416.92

Monthly Mercury Analysis

Train #	Sample #	% Moist.	Mercury ug/g dry basis	Chloride ug/g

BIG STONE PLANT COAL ANALYSIS PER TRAIN
Feb-03 PAGE 1

DATE	TR #	MOIS %	ASH AR	HHV AR	S, % AR	% ASH DRY	HHV DRY	S, % DRY	NaO %	MAF HHV	COAL TONS	TONS OK
PREV. MO	bam11	29.3	4.27	8704	0.28	6.04	12308	0.39	1.38	13099	13,322.95	364.61
PREV. MO	bam12	29.9	4.42	8593	0.27	6.3	12250	0.39	1.42	13074	13,171.28	13171.28
1-Feb-03	0	0	0	0	0	0	0	0	0	0	0.00	0.00
2-Feb-03	0	0	0	0	0	0	0	0	0	0	0.00	0.00
3-Feb-03	bam13	30.2	4.24	8571	0.24	6.08	12285	0.35	1.63	13080	13082.78	13082.78
4-Feb-03	bam14	30.2	4.48	8530	0.25	6.42	12213	0.36	1.47	13051	13160.30	13160.30
5-Feb-03	0	0	0	0	0	0	0	0	0	0	0.00	0.00
6-Feb-03	0	0	0	0	0	0	0	0	0	0	0.00	0.00
7-Feb-03	bam15	30.1	4.29	8494	0.28	6.14	12158	0.4	1.66	12953	13275.88	13275.88
8-Feb-03	0	0	0	0	0	0	0	0	0	0	0.00	0.00
9-Feb-03	bam16	29.4	4.12	8681	0.28	5.84	12299	0.39	1.67	13062	12953.88	12953.88
10-Feb-03	0	0	0	0	0	0	0	0	0	0	0.00	0.00
11-Feb-03	0	0	0	0	0	0	0	0	0	0	0.00	0.00
12-Feb-03	bam17	29.2	4.5	8669	0.28	6.36	12244	0.4	1.43	13076	13273.08	13273.08
13-Feb-03	bam18	29.3	4.31	8651	0.27	6.09	12229	0.38	1.46	13022	12419.18	12419.18
14-Feb-03	0	0	0	0	0	0	0	0	0	0	0.00	0.00
15-Feb-03	0	0	0	0	0	0	0	0	0	0	0.00	0.00
16-Feb-03	ebm02	30.4	5.02	8413	0.45	7.21	12090	0.64	1.76	13029	12751.52	12751.52
17-Feb-03	0	0	0	0	0	0	0	0	0	0	0.00	0.00
18-Feb-03	ebm03	30.8	5.24	8316	0.39	7.57	12010	0.56	1.73	12994	13309.73	13309.73
19-Feb-03	0	0	0	0	0	0	0	0	0	0	0.00	0.00
20-Feb-03	bam19	29.2	4.51	8656	0.3	6.37	12218	0.43	1.51	13049	13185.42	13185.42
21-Feb-03	0	0	0	0	0	0	0	0	0	0	0.00	0.00
22-Feb-03	bam20	28.9	4.51	8639	0.28	6.35	12158	0.4	1.47	12982	13672.10	12727.61
23-Feb-03	0	0	0	0	0	0	0	0	0	0	0.00	0.00
24-Feb-03	0	0	0	0	0	0	0	0	0	0	0.00	0.00
25-Feb-03	bam21	30.4	4.3	8520	0.26	6.18	12234	0.37	1.53	13040	13671.40	0.00
26-Feb-03	0	0	0	0	0	0	0	0	0	0	0.00	0.00
27-Feb-03	bam22	29.2	4.46	8656	0.28	6.3	12230	0.39	1.47	13052	10746.15	0.00
28-Feb-03	0	0	0	0	0	0	0	0	0	0	0.00	0.00
ADJ.												143675.26
											Tons. OK	154405.86
Weighted Average		29.81	4.58	8551	0.30	6.53	12182	0.43	1.56		Burn	154405.86

Monthly Mercury Analysis

Train #	Sample #	% Moist.	Mercury ug/g dry basis	Chloride ug/g
	C303	30.26	0.103	<0.01

BIG STONE PLANT COAL ANALYSIS PER TRAIN
Mar-03 PAGE 1

DATE	TR #	MOIS %	ASI % AR	HHV AR	S, % AR	% ASH DRY	HHV DRY	S, % DRY	NaO %	MAF HHV	COAL TONS	TONS OK
PREV.	bam20	28.9	4.51	8639	0.28	6.35	12158	0.4	1.5	12982	13672.10	944.49
PREV.	bam21	30.36	4.30	8520	0.26	6.18	12234	0.37	1.53	13040	13671.40	13671.40
1-Mar-03	0	0	0	0	0	0	0	0	0	0	0.00	0.00
2-Mar-03	0	29.2	4.46	8656	0.28	6.3	12230	0.39	1.5	13052	0.00	0.00
3-Mar-03	0	0	0	0	0	0	0	0	0	0	0.00	0.00
4-Mar-03	0	0	0	0	0	0	0	0	0	0	0.00	0.00
5-Mar-03	0	0	0	0	0	0	0	0	0	0	0.00	0.00
6-Mar-03	ebm04	30.4	4.71	8455	0.41	6.76	12143	0.59	1.8	13023	13682.43	13682.43
7-Mar-03	0	0	0	0	0	0	0	0	0	0	0.00	0.00
8-Mar-03	0	0	0	0	0	0	0	0	0	0	0.00	0.00
9-Mar-03	bam23	30.8	4.27	8457	0.25	6.17	12221	0.36	1.4	13025	13360.65	13360.65
10-Mar-03	ebm05	30.6	4.37	8466	0.36	6.3	12195	0.52	1.9	13015	13486.15	13486.15
11-Mar-03	0	0	0	0	0	0	0	0	0	0	0.00	0.00
12-Mar-03	bam24	29.3	4.48	8658	0.28	6.34	12239	0.39	1.5	13067	13064.15	13064.15
13-Mar-03	0	0	0	0	0	0	0	0	0	0	0.00	0.00
14-Mar-03	0	0	0	0	0	0	0	0	0	0	0.00	0.00
15-Mar-03	bam25	29.1	4.69	8612	0.3	6.61	12147	0.42	1.6	13007	13310.88	13310.88
16-Mar-03	bam26	29.2	4.37	8645	0.25	6.17	12212	0.36	1.6	13015	13176.13	13176.13
17-Mar-03	0	0	0	0	0	0	0	0	0	0	0.00	0.00
18-Mar-03	0	0	0	0	0	0	0	0	0	0	0.00	0.00
19-Mar-03	0	0	0	0	0	0	0	0	0	0	0.00	0.00
20-Mar-03	bam27	30	4.3	8578	0.27	6.15	12256	0.38	1.5	13059	14006.18	14006.18
21-Mar-03	0	0	0	0	0	0	0	0	0	0	0.00	0.00
22-Mar-03	bam28	29.5	4.16	8648	0.24	5.9	12270	0.34	1.6	13039	13148.65	13148.65
23-Mar-03	0	0	0	0	0	0	0	0	0	0	0.00	0.00
24-Mar-03	bam29	29.7	4.85	8543	0.3	6.9	12143	0.42	1.3	13043	14094.48	14094.48
25-Mar-03	0	0	0	0	0	0	0	0	0	0	0.00	0.00
26-Mar-03	0	0	0	0	0	0	0	0	0	0	0.00	0.00
27-Mar-03	bam30	30.1	4.58	8485	0.26	6.55	12132	0.37	1.5	12982	14088.83	14088.83
28-Mar-03	0	0	0	0	0	0	0	0	0	0	0.00	0.00
29-Mar-03	bam31	29.5	4.23	8621	0.25	6	12221	0.35	1.5	13001	14033.93	15501.37
30-Mar-03	0	0	0	0	0	0	0	0	0	0	0.00	0.00
31-Mar-03	bam32	29.6	4.78	8594	0.29	6.79	12205	0.41	1.4	13094	14127.90	0.00
ADJ.												165535.78
											Tons. OK	177636.53
Weighted Average		29.82	4.45	8562	0.29	6.35	12201	0.40	1.54		Burn	177636.53

Monthly Mercury Analysis

Train #	Sample #	% Moist.	Mercury ug/g dry basis	Chloride ug/g
	C550	29.23	0.116	<0.01

BIG STONE PLANT COAL ANALYSIS PER TRAIN
Apr-03 PAGE 1

DATE	TR #	MOIS %	% ASH AR	HHV AR	S, % AR	% ASH DRY	HHV DRY	S, % DRY	NaO %	MAF HHV	COAL TONS	TONS OK
PREV. MON.												
PREV. MO	bam32	29.6	4.78	8594	0.29	6.79	12205	0.41	1.4	13094	14127.90	12660.46
1-Apr-03	0	0	0	0	0	0	0	0	0	0	0.00	
2-Apr-03	bam33	30	4.29	8551	0.27	6.12	12209	0.38	1.5	13005	13939.48	13939.48
3-Apr-03	0	0	0	0	0	0	0	0	0	0	0.00	
4-Apr-03	bam34	29	4.7	8657	0.28	6.61	12184	0.39	1.4	13046	14163.38	14163.38
5-Apr-03	0	0	0	0	0	0	0	0	0	0	0.00	
6-Apr-03	bam35	30	4.38	8562	0.27	6.26	12233	0.38	1.4	13050	12755.10	12755.10
7-Apr-03	ebm06	30.4	4.83	8392	0.43	6.94	12049	0.62	1.9	12948	10068.83	10068.83
8-Apr-03	0	0	0	0	0	0	0	0	0	0	0.00	
9-Apr-03	0	0	0	0	0	0	0	0	0	0	0.00	
10-Apr-03	ebm07	30.5	5.03	8401	0.43	7.23	12079	0.62	1.7	13020	7781.13	7781.13
11-Apr-03	ebm08	30.6	4.76	8404	0.43	6.86	12101	0.62	1.9	12992	14165.00	14165.00
12-Apr-03	0	0	0	0	0	0	0	0	0	0	0.00	
13-Apr-03	0	0	0	0	0	0	0	0	0	0	0.00	
14-Apr-03	0	0	0	0	0	0	0	0	0	0	0.00	
15-Apr-03	0	0	0	0	0	0	0	0	0	0	0.00	
16-Apr-03	ebm09	30.1	4.67	8435	0.44	6.68	12072	0.63	1.9	12936	14166.48	14166.48
17-Apr-03	ebm10	30.5	4.77	8410	0.42	6.86	12103	0.61	1.9	12994	14176.43	14176.43
18-Apr-03	0	0	0	0	0	0	0	0	0	0	0.00	
19-Apr-03	0	0	0	0	0	0	0	0	0	0	0.00	
20-Apr-03	ebm11	31.1	4.47	8375	0.33	6.49	12146	0.48	2	12989	14180.15	14180.15
21-Apr-03	bam36	29.9	4.39	8569	0.28	6.26	12221	0.4	1.6	13037	14148.50	14148.50
22-Apr-03	0	0	0	0	0	0	0	0	0	0	0.00	
23-Apr-03	0	0	0	0	0	0	0	0	0	0	0.00	
24-Apr-03	ebm12	31	4.87	8352	0.44	7.06	12098	0.64	1.8	13017	10432.75	10432.75
25-Apr-03	bam37	28.9	4.5	8689	0.3	6.33	12228	0.42	1.4	13054	12652.40	9165.71
26-Apr-03	0	0	0	0	0	0	0	0	0	0	0.00	
27-Apr-03	0	0	0	0	0	0	0	0	0	0	0.00	
28-Apr-03	0	0	0	0	0	0	0	0	0	0	0.00	
29-Apr-03	0	0	0	0	0	0	0	0	0	0	0.00	
30-Apr-03	bam38	28.5	4.59	8716	0.28	6.42	12192	0.39	1.4	13028	14146.10	0.00
ADJ.												161803.40
											Tons. OK	164805.80
Weighted Average		30.11	4.65	8491	0.35	6.65	12148	0.50	1.67		Burn	164805.80

Monthly Mercury Analysis

Train #	Sample #	% Moist.	Mercury ug/g dry basis	Chloride ug/g
			0.116	<0.01

BIG STONE PLANT COAL ANALYSIS PER TRAIN

May-03 PAGE 1

DATE	TR #	MOIS %	% ASH AR	HHV AR	S, % AR	% ASH DRY	HHV DRY	S, % DRY	NaO %	MAF HHV	COAL TONS	TONS OK
PREV. MO	bam37	28.9	4.5	8689	0.3	6.33	12228	0.42	1.38	13054	12652.400	3486.690
PREV. MO	bam38	28.5	4.59	8716	0.28	6.42	12192	0.39	1.36	13028	14146.100	14146.100
1-May-03	0	0	0	0	0	0	0	0	0	0	0.000	
2-May-03	ebm13	30.4	4.9	8415	0.42	7.03	12083	0.6	1.7	12997	14172.650	14172.650
3-May-03	0	0	0	0	0	0	0	0	0	0	0.000	
4-May-03	bam39	29.4	4.26	8636	0.27	6.04	12237	0.38	1.48	13024	14135.200	14135.200
5-May-03	0	0	0	0	0	0	0	0	0	0	0.000	
6-May-03	0	0	0	0	0	0	0	0	0	0	0.000	
7-May-03	ebm14	30.4	4.69	8416	0.42	6.73	12087	0.6	1.89	12959	13846.500	13846.500
8-May-03	0	0	0	0	0	0	0	0	0	0	0.000	
9-May-03	bam40	29.1	4.66	8626	0.3	6.57	12165	0.42	1.5	13020	14131.625	14131.625
10-May-03	0	0	0	0	0	0	0	0	0	0	0.000	
11-May-03	0	0	0	0	0	0	0	0	0	0	0.000	
12-May-03	ebm15	30.7	4.76	8354	0.38	6.87	12059	0.55	1.86	12949	14154.950	14154.950
13-May-03	bam41	29	4.53	8658	0.29	6.38	12189	0.41	1.36	13020	14059.200	14059.200
14-May-03	0	0	0	0	0	0	0	0	0	0	0.000	
15-May-03	0	0	0	0	0	0	0	0	0	0	0.000	
16-May-03	0	0	0	0	0	0	0	0	0	0	0.000	
17-May-03	bam42	30.1	4.86	8488	0.27	6.96	12147	0.38	1.34	13056	14163.980	14163.980
18-May-03	bam43	30.1	4.9	8436	0.27	7.01	12076	0.39	1.31	12986	14176.330	14176.330
19-May-03	0	0	0	0	0	0	0	0	0	0	0.000	
20-May-03	0	0	0	0	0	0	0	0	0	0	0.000	
21-May-03	bam44	29	4.57	8692	0.3	6.44	12245	0.42	1.52	13088	14162.750	14162.750
22-May-03	bam45	29.1	4.42	8669	0.28	6.24	12232	0.4	1.52	13046	11741.200	11741.200
23-May-03	0	0	0	0	0	0	0	0	0	0	0.000	
24-May-03	0	0	0	0	0	0	0	0	0	0	0.000	
25-May-03	0	0	0	0	0	0	0	0	0	0	0.000	
26-May-03	bam46	29.8	4.16	8576	0.25	5.92	12210	0.36	1.53	12978	14149.525	14149.525
27-May-03	bam47	29.6	4.38	8582	0.25	6.22	12194	0.36	1.49	13003	14181.670	14181.670
28-May-03	0	0	0	0	0	0	0	0	0	0	0.000	
29-May-03	0	0	0	0	0	0	0	0	0	0	0.000	
30-May-03	0	0	0	0	0	0	0	0	0	0	0.000	
31-May-03	ebm16	30.6	4.63	8390	0.43	6.67	12095	0.62	1.83	12959	14184.750	134.460
ADJ.												184842.830
											Tons. OK	184842.830
Weighted Average		29.63	4.59	8560	0.31	6.53	12163	0.44	1.52		Burn	184842.830

Monthly Mercury Analysis

Train #	Sample #	% Moist.	Mercury ug/g dry basis	Chloride ug/g

BIG STONE PLANT COAL ANALYSIS PER TRAIN

Jun-03 PAGE 1

DATE	TR #	MOIS. %	% ASH AR	HHV AR	S, % AR	% ASH DRY	HHV DRY	S, % DRY	NaO %	MAF HHV	COAL TONS	TONS OK
PREV. MON.												
PREV. MO	ebm16	30.63	4.63	8390	0.43	6.67	12095	0.62	1.8	12959	14184.75	14050.29
1-Jun-03	0	0	0	0	0	0	0	0	0	0	0.00	
2-Jun-03	0	0	0	0	0	0	0	0	0	0	0.00	
3-Jun-03	0	0	0	0	0	0	0	0	0	0	0.00	
4-Jun-03	0	0	0	0	0	0	0	0	0	0	0.00	
5-Jun-03	0	0	0	0	0	0	0	0	0	0	0.00	
6-Jun-03	0	0	0	0	0	0	0	0	0	0	0.00	
7-Jun-03	0	0	0	0	0	0	0	0	0	0	0.00	
8-Jun-03	0	0	0	0	0	0	0	0	0	0	0.00	
9-Jun-03	0	0	0	0	0	0	0	0	0	0	0.00	
10-Jun-03	0	0	0	0	0	0	0	0	0	0	0.00	
11-Jun-03	bam048	29.62	4.49	8611	0.28	6.38	12235	0.4	1.5	13069	14162.73	14162.73
12-Jun-03	0	0	0	0	0	0	0	0	0	0	0.00	
13-Jun-03	0	0	0	0	0	0	0	0	0	0	0.00	
14-Jun-03	ebm017	30.7	4.57	8378	0.42	6.59	12089	0.61	1.9	12942	14176.20	14176.20
15-Jun-03	bam049	29.98	4.46	8547	0.27	6.37	12207	0.39	1.5	13037	14161.78	14161.78
16-Jun-03	0	0	0	0	0	0	0	0	0	0	0.00	
17-Jun-03	0	0	0	0	0	0	0	0	0	0	0.00	
18-Jun-03	ebm18	30.78	4.67	8339	0.41	6.75	12047	0.59	1.9	12919	14180.70	14180.70
19-Jun-03	0	0	0	0	0	0	0	0	0	0	0.00	
20-Jun-03	bam50	29.1	4.5	8698	0.28	6.35	12268	0.4	1.4	13100	14170.08	14170.08
21-Jun-03	0	0	0	0	0	0	0	0	0	0	0.00	
22-Jun-03	0	0	0	0	0	0	0	0	0	0	0.00	
23-Jun-03	ebm19	30.47	4.74	8410	0.42	6.82	12096	0.6	1.8	12981	14175.33	14175.33
24-Jun-03	bam51	29.47	4.27	8602	0.28	6.06	12196	0.39	1.8	12983	14161.33	14161.33
25-Jun-03	0	0	0	0	0	0	0	0	0	0	0.00	
26-Jun-03	gregerso	30.47	4.74	8410	0.42	6.82	12096	0.6	1.8	12981	1871.60	1871.60
27-Jun-03	ebm20	30.76	4.75	8357	0.43	6.86	12069	0.62	1.8	12958	14166.25	12869.48
28-Jun-03	0	0	0	0	0	0	0	0	0	0	0.00	
29-Jun-03	bam52	29.71	4.19	8605	0.23	5.96	12242	0.33	1.5	13018	14160.08	
30-Jun-03	0	0	0	0	0	0	0	0	0	0	0.00	
ADJ.												127979.52
											Tons. OK	127979.52
Weighted Avg.		30.17	4.57	8482	0.36	6.54	12145	0.51	1.72		Burn	127979.52

Monthly Mercury Analysis

Train #	Sample #	% Moist.	Mercury ug/g dry basis	Chloride ug/g

BIG STONE PLANT COAL ANALYSIS PER TRAIN

Jul-03 PAGE 1

DATE	TR #	MOIS %	% ASH AR	HHV AR	S, % AR	% ASH DRY	HHV DRY	S, % DRY	NaO %	MAF HHV	COAL TONS	TONS OK
PREV. MC	ebm20	30.8	4.75	8357	0.43	6.86	12069	0.62	1.83	12958	14166.25	1296.77
PREV. MC	bam52	29.7	4.19	8605	0.23	5.96	12242	0.33	1.52	13018	14160.08	14160.08
1-Jul-03	0	0	0	0	0	0	0	0	0	0	0.00	
2-Jul-03	ebm21	31.2	4.85	8312	0.41	7.04	12075	0.6	1.76	12989	14166.88	14166.88
3-Jul-03	bam053	29.3	4.32	8606	0.25	6.12	12180	0.36	1.62	12974	14173.35	14173.35
4-Jul-03	0	0	0	0	0	0	0	0	0	0	0.00	
5-Jul-03	0	0	0	0	0	0	0	0	0	0	0.00	
6-Jul-03	0	0	0	0	0	0	0	0	0	0	0.00	
7-Jul-03	bam054	29.3	4.47	8595	0.28	6.32	12161	0.39	1.56	12981	12952.58	12952.58
8-Jul-03	0	0	0	0	0	0	0	0	0	0	0.00	
9-Jul-03	bam055	29.4	4.41	8585	0.26	6.24	12160	0.37	1.49	12969	14160.63	14160.63
10-Jul-03	0	0	0	0	0	0	0	0	0	0	0.00	
11-Jul-03	0	0	0	0	0	0	0	0	0	0	0.00	
12-Jul-03	0	0	0	0	0	0	0	0	0	0	0.00	
13-Jul-03	bam056	28.8	4.73	8623	0.3	6.65	12114	0.42	1.34	12977	14178.45	14178.45
14-Jul-03	0	0	0	0	0	0	0	0	0	0	0.00	
15-Jul-03	bam057	29.5	4.25	8610	0.26	6.03	12216	0.37	1.52	13000	14178.85	14178.85
16-Jul-03	0	0	0	0	0	0	0	0	0	0	0.00	
17-Jul-03	bam58	29	4.38	8706	0.29	6.17	12265	0.41	1.51	13072	14178.40	14178.40
18-Jul-03	0	0	0	0	0	0	0	0	0	0	0.00	
19-Jul-03	0	0	0	0	0	0	0	0	0	0	0.00	
20-Jul-03	0	0	0	0	0	0	0	0	0	0	0.00	
21-Jul-03	bam59	29.3	4.44	8634	0.31	6.28	12211	0.44	1.5	13029	14140.95	14140.95
22-Jul-03	ebm22	29.9	4.91	8472	0.49	7.01	12084	0.7	1.87	12995	14169.00	14169.00
23-Jul-03	0	0	0	0	0	0	0	0	0	0	0.00	
24-Jul-03	0	0	0	0	0	0	0	0	0	0	0.00	
25-Jul-03	0	0	0	0	0	0	0	0	0	0	0.00	
26-Jul-03	bam60	28.4	4.85	8630	0.26	6.78	12056	0.37	1.36	12933	14154.60	14154.60
27-Jul-03	bam61	28.8	4.18	8671	0.28	5.87	12179	0.4	1.55	12938	14182.30	14182.30
28-Jul-03	0	0	0	0	0	0	0	0	0	0	0.00	
29-Jul-03	0	0	0	0	0	0	0	0	0	0	0.00	
30-Jul-03	0	0	0	0	0	0	0	0	0	0	0.00	
31-Jul-03	0	0	0	0	0	0	0	0	0	0	0.00	
ADJ.												170092.84
											Tons. OK	192005.80
Weighted Average		29.49	4.61	8561	0.30	6.55	12142	0.43	1.55		Burn	192005.80

Monthly Mercury Analysis

Train #	Sample #	% Moist.	Mercury ug/g dry basis	Chloride ug/g
	C1364	30.39	0.105	<0.01

BIG STONE PLANT COAL ANALYSIS PER TRAIN
Aug-03 PAGE 1

DATE	TR #	MOIS %	ASH % AR	HHV AR	S, % AR	% ASH DRY	HHV DRY	S, % DRY	NaO %	MAF HHV	COAL TONS	TONS OK
PREV. MON.												
PREV. MON.												
1-Aug-03	ebm23	30.2	4.77	8449	0.43	6.84	12105	0.61	1.89	12994	14170.08	14170.08
2-Aug-03	bam62	28.8	4.33	8708	0.3	6.08	12227	0.42	1.58	13019	14174.10	14174.10
3-Aug-03	0	0	0	0	0	0	0	0	0	0	0.00	
4-Aug-03	0	0	0	0	0	0	0	0	0	0	0.00	
5-Aug-03	ebm24	30.3	5.12	8366	0.43	7.34	11997	0.62	1.78	12947	14185.32	14185.32
6-Aug-03	0	0	0	0	0	0	0	0	0	0	0.00	
7-Aug-03	bam63	29	4.36	8721	0.28	6.14	12274	0.4	1.48	13077	14180.18	14180.18
8-Aug-03	0	0	0	0	0	0	0	0	0	0	0.00	
9-Aug-03	0	0	0	0	0	0	0	0	0	0	0.00	
10-Aug-03	bam64	28.6	4.25	8714	0.29	5.95	12211	0.4	1.49	12984	14163.80	14163.80
11-Aug-03	bam65	28.5	4.49	8712	0.31	6.28	12191	0.44	1.53	13008	14179.73	14179.73
12-Aug-03	0	0	0	0	0	0	0	0	0	0	0.00	
13-Aug-03	0	0	0	0	0	0	0	0	0	0	0.00	
14-Aug-03	bam66	28.8	4.43	8645	0.29	6.23	12149	0.41	1.44	12956	14163.08	14163.08
15-Aug-03	0	0	0	0	0	0	0	0	0	0	0.00	
16-Aug-03	bam67	28.7	4.71	8627	0.29	6.6	12099	0.41	1.46	12954	14179.60	14179.60
17-Aug-03	0	0	0	0	0	0	0	0	0	0	0.00	
18-Aug-03	bam68	28.6	4.52	8663	0.29	6.33	12140	0.41	1.51	12960	14170.10	14170.10
19-Aug-03	0	0	0	0	0	0	0	0	0	0	0.00	
20-Aug-03	0	0	0	0	0	0	0	0	0	0	0.00	
21-Aug-03	0	0	0	0	0	0	0	0	0	0	0.00	
22-Aug-03	bam69	29.3	4.79	8541	0.29	6.78	12083	0.41	1.63	12962	14042.45	14042.45
23-Aug-03	bam70	29.4	4.67	8541	0.3	6.61	12099	0.43	1.54	12955	14179.40	14179.40
24-Aug-03	0	0	0	0	0	0	0	0	0	0	0.00	
25-Aug-03	0	0	0	0	0	0	0	0	0	0	0.00	
26-Aug-03	0	0	0	0	0	0	0	0	0	0	0.00	
27-Aug-03	bam71	29.4	4.6	8591	0.3	6.52	12168	0.43	1.49	13017	14164.35	14164.35
28-Aug-03	bam72	29.6	4.53	8590	0.27	6.43	12193	0.39	1.56	13031	14167.83	4375.44
29-Aug-03	0	0	0	0	0	0	0	0	0	0	0.00	
30-Aug-03	0	0	0	0	0	0	0	0	0	0	0.00	
31-Aug-03	0	0	0	0	0	0	0	0	0	0	0.00	
												174327.63
											Tons. OK	200219.47
Weighted Average		29.29	4.70	8575	0.31	6.66	12127	0.45	1.56		Burn	200219.47

Monthly Mercury Analysis

Train #	Sample #	% Moist.	Mercury ug/g dry basis	Chlor. ug/g
	C1719	28.75	0.081	<0.01

BIG STONE PLANT COAL ANALYSIS PER TRAIN
Sep-03 PAGE 1

DATE	TR #	MOIS. %	% ASH AR	HHV AR	S, % AR	% ASH DRY	HHV DRY	S, % DRY	NaO %	MAF HHV	COAL TONS	TONS OK
PREV. MON.												
PREV. MON.	bam72	29.55	4.53	8590	0.27	6.43	12193	0.39	1.6	13031	14167.83	9792.39
1-Sep-03	bam74	29.19	4.33	8623	0.28	6.11	12178	0.4	1.6	12970	14175.15	14175.15
2-Sep-03	0	0	0	0	0	0	0	0	0	0	0.00	
3-Sep-03	bam73	29	4.25	8640	0.26	5.99	12169	0.36	1.5	12944	13314.88	13314.88
4-Sep-03	0	0	0	0	0	0	0	0	0	0	0.00	
5-Sep-03	0	30.35	4.7	8423	0.42	6.75	12093	0.61	1.9	12968	597.50	597.50
6-Sep-03	ebm25	30.35	4.7	8423	0.42	6.75	12093	0.61	1.9	12968	14177.73	14177.73
7-Sep-03	bam75	28.72	4.66	8667	0.3	6.54	12159	0.42	1.4	13010	14133.38	14133.38
8-Sep-03	0	0	0	0	0	0	0	0	0	0	0.00	
9-Sep-03	0	0	0	0	0	0	0	0	0	0	0.00	
10-Sep-03	0	0	0	0	0	0	0	0	0	0	0.00	
11-Sep-03	ebm26	30.46	4.76	8404	0.42	6.84	12085	0.61	1.8	12972	14174.25	14174.25
12-Sep-03	bam76	29.84	4.26	8573	0.25	6.07	12219	0.36	1.6	13009	12958.07	12958.07
13-Sep-03	0	0	0	0	0	0	0	0	0	0	0.00	
14-Sep-03	0	0	0	0	0	0	0	0	0	0	0.00	
15-Sep-03	0	0	0	0	0	0	0	0	0	0	0.00	
16-Sep-03	bam77	29.81	4.23	8570	0.26	6.02	12210	0.37	1.6	12992	14189.58	14189.58
17-Sep-03	ebm27	30.98	4.42	8364	0.34	6.4	12118	0.49	2	12947	13756.80	13756.80
18-Sep-03	0	0	0	0	0	0	0	0	0	0	0.00	
19-Sep-03	0	0	0	0	0	0	0	0	0	0	0.00	
20-Sep-03	0	0	0	0	0	0	0	0	0	0	0.00	
21-Sep-03	ebm28	30.61	4.84	8385	0.43	6.98	12084	0.62	1.8	12991	13204.48	13204.48
22-Sep-03	bam78	28.56	4.68	8662	0.29	6.55	12125	0.41	1.5	12975	14186.47	14186.47
23-Sep-03	0	0	0	0	0	0	0	0	0	0	0.00	
24-Sep-03	0	0	0	0	0	0	0	0	0	0	0.00	
25-Sep-03	bam079	28.94	4.58	8635	0.29	6.45	12152	0.41	1.4	12990	14189.03	14189.03
26-Sep-03	0	0	0	0	0	0	0	0	0	0	0.00	
27-Sep-03	0	0	0	0	0	0	0	0	0	0	0.00	
28-Sep-03	bam80	29.84	4.61	8515	0.26	6.57	12137	0.37	1.5	12990	13928.00	10046.71
29-Sep-03	ebm29	30.12	4.87	8409	0.43	6.97	12034	0.61	1.7	12936	12972.78	
30-Sep-03	ebm30	30.4	4.91	8399	0.4	7.05	12068	0.58	1.8	12983	11613.50	
ADJ.												172896.42
											Tons. OK	185611.32
Weighted Average		29.71	4.59	8530	0.32	6.54	12136	0.45	1.62		Burn	185611.32

Monthly Mercury Analysis

Train #	Sample #	% Moist.	Mercury ug/g dry basis	Chlor. ug/g
	C2105	29.35	0.08	<0.01%

BIG STONE PLANT COAL ANALYSIS PER TRAIN
Oct-03 PAGE 1

DATE	TR #	MOIS. %	% ASH AR	HHV AR	S, % AR	% ASH DRY	HHV DRY	S, % DRY	NaO %	MAF HHV	COAL TONS	TONS OK
PREV. MON.												
PREV. MON.												
1-Oct-03	0	0	0	0	0	0	0	0	0	0	0.000	0.000
2-Oct-03	bam81	29.59	4.37	8580	0.24	6.2	12186	0.34	1.56	12991	9755.200	9755.200
3-Oct-03	0	0	0	0	0	0	0	0	0	0	0.000	0.000
4-Oct-03	ebm31	30.19	4.78	8446	0.42	6.84	12098	0.6	1.9	12986	8781.275	8781.275
5-Oct-03	bam82	29.05	4.42	8654	0.31	6.23	12197	0.43	1.49	13007	9557.500	9557.500
6-Oct-03	0	0	0	0	0	0	0	0	0	0	0.000	0.000
7-Oct-03	bam83	28.99	4.54	8696	0.3	6.4	12246	0.42	1.71	13083	8852.525	8852.525
8-Oct-03	ebm32	29.8	4.84	8515	0.41	6.9	12130	0.59	1.83	13029	13087.700	13087.700
9-Oct-03	0	0	0	0	0	0	0	0	0	0	0.000	0.000
10-Oct-03	0	0	0	0	0	0	0	0	0	0	0.000	0.000
11-Oct-03	0	0	0	0	0	0	0	0	0	0	0.000	0.000
12-Oct-03	bam84	28.72	4.63	8673	0.31	6.49	12168	0.44	1.4	13013	14172.250	14172.250
13-Oct-03	bam85	29.19	4.26	8664	0.28	6.01	12236	0.39	1.52	13018	12636.750	12636.750
14-Oct-03	0	0	0	0	0	0	0	0	0	0	0.000	0.000
15-Oct-03	0	0	0	0	0	0	0	0	0	0	0.000	0.000
16-Oct-03	ebm33	30.09	4.77	8454	0.34	6.82	12093	0.49	1.72	12978	14176.000	14176.000
17-Oct-03	bam86	29.41	4.45	8620	0.25	6.3	12212	0.36	1.54	13033	14023.050	14023.050
18-Oct-03	0	0	0	0	0	0	0	0	0	0	0.000	0.000
19-Oct-03	0	0	0	0	0	0	0	0	0	0	0.000	0.000
20-Oct-03	btm001	26.87	5.43	8818	0.31	7.43	12058	0.42	1.19	0	11990.200	11990.200
21-Oct-03	btm02	26.64	5.39	8864	0.25	7.35	12083	0.34	1.17	0	11620.100	11620.100
22-Oct-03	0	0	0	0	0	0	0	0	0	0	0.000	0.000
23-Oct-03	0	0	0	0	0	0	0	0	0	0	0.000	0.000
24-Oct-03	0	0	0	0	0	0	0	0	0	0	0.000	0.000
25-Oct-03	btm03	27.18	5.25	8809	0.26	7.21	12097	0.36	1.25	0	14197.450	14197.450
26-Oct-03	0	0	0	0	0	0	0	0	0	0	0.000	0.000
27-Oct-03	btm04	26.96	5.36	8835	0.25	7.34	12096	0.34	1.08	0	13716.600	13716.600
28-Oct-03	0	0	0	0	0	0	0	0	0	0	0.000	0.000
29-Oct-03	bam87	29.17	4.71	8647	0.31	6.65	12208	0.44	1.33	13078	14149.450	6542.450
30-Oct-03	0	0	0	0	0	0	0	0	0	0	0.000	
31-Oct-03	bam88	28.61	4.57	8693	0.31	6.4	12177	0.43	1.52	13010	14104.600	
ADJ.											184820.650	163109.050
											Tons. OK	191576.460
Weighted Average		28.87	4.83	8630	0.31	6.78	12133	0.44	1.50		Burn	191576.460

Monthly Mercury Analysis

Train #	Sample #	% Moist.	Mercury ug/g dry basis	Chlor. ug/g

BIG STONE PLANT COAL ANALYSIS PER TRAIN
Nov-03 PAGE 1

DATE	TR #	MOIS. %	% ASH AR	HHV AR	S, % AR	% ASH DRY	HHV DRY	S, % DRY	NaO %	MAF HHV	COAL TONS	TONS OK
PREV. MON	bam87	29.17	4.71	8647	0.31	6.65	12208	0.44	1.3	13078	14149.45	7607.00
PREV. MON	bam88	28.61	4.57	8693	0.31	6.4	12177	0.43	1.5	13010	14104.60	14104.60
1-Nov-03	0	0	0	0	0	0	0	0	0	0	0.00	0.00
2-Nov-03	bam89	29.21	4.24	8642	0.24	5.99	12208	0.34	1.5	12986	14255.77	14255.77
3-Nov-03	0	0	0	0	0	0	0	0	0	0	0.00	0.00
4-Nov-03	0	0	0	0	0	0	0	0	0	0	0.00	0.00
5-Nov-03	bam90	28.9	4.66	8661	0.28	6.55	12181	0.4	1.5	13035	14137.13	14137.13
6-Nov-03	0	0	0	0	0	0	0	0	0	0	0.00	0.00
7-Nov-03	ebm34	30.2	5.03	8442	0.42	7.2	12095	0.6	1.7	13033	14009.60	14009.60
8-Nov-03	0	0	0	0	0	0	0	0	0	0	0.00	0.00
9-Nov-03	0	0	0	0	0	0	0	0	0	0	0.00	0.00
10-Nov-03	ebm35	30.1	4.79	8445	0.41	6.85	12082	0.59	1.8	12970	13835.97	13835.97
11-Nov-03	0	0	0	0	0	0	0	0	0	0	0.00	0.00
12-Nov-03	ebm36	30.02	4.72	8468	0.41	6.75	12101	0.58	1.8	12977	13431.50	13431.50
13-Nov-03	0	0	0	0	0	0	0	0	0	0	0.00	0.00
14-Nov-03	ebm37	29.85	5.06	8504	0.43	7.22	12123	0.62	1.7	13066	14175.60	14175.60
15-Nov-03	0	0	0	0	0	0	0	0	0	0	0.00	0.00
16-Nov-03	0	0	0	0	0	0	0	0	0	0	0.00	0.00
17-Nov-03	bam91	29.35	4.57	8626	0.31	6.47	12210	0.44	1.5	13055	14132.80	14132.80
18-Nov-03	0	0	0	0	0	0	0	0	0	0	0.00	0.00
19-Nov-03	ebm38	30.5	4.76	8455	0.4	6.85	12165	0.58	1.9	13060	14168.75	14168.75
20-Nov-03	0	0	0	0	0	0	0	0	0	0	0.00	0.00
21-Nov-03	ebm39	30.26	4.7	8420	0.39	6.74	12073	0.56	1.9	12946	14172.00	14172.00
22-Nov-03	0	0	0	0	0	0	0	0	0	0	0.00	0.00
23-Nov-03	0	0	0	0	0	0	0	0	0	0	0.00	0.00
24-Nov-03	ebm40	30.45	4.74	8457	0.38	6.82	12159	0.55	1.8	13049	14152.15	14152.15
25-Nov-03	ebm41	29.95	4.98	8477	0.42	7.11	12101	0.6	1.8	13027	14096.00	14096.00
26-Nov-03	0	0	0	0	0	0	0	0	0	0	0.00	0.00
27-Nov-03	0	0	0	0	0	0	0	0	0	0	0.00	0.00
28-Nov-03	0	0	0	0	0	0	0	0	0	0	0.00	0.00
29-Nov-03	bam92	29.89	4.27	8584	0.26	6.09	12244	0.37	1.7	13038	12974.10	5244.85
30-Nov-03	ebm42	30.48	4.77	8454	0.43	6.86	12160	0.62	1.9	13056	14089.13	0.00
ADJ.												181523.72
											Tons. OK	194277.02
Weighted Average		29.79	4.77	8521	0.36	6.80	12136	0.51	1.68		Burn	194155.92

Monthly Mercury Analysis

Train #	Sample #	% Moist.	Mercury ug/g dry basis	Chlor. ug/g
	C2557	29.51	0.07	<0.01

BIG STONE PLANT COAL ANALYSIS PER TRAIN
Dec-03 PAGE 1

DATE	TR #	MOIS % AR	ASI % AR	HHV AR	S, % AR	% ASH DRY	HHV DRY	S, % DRY	NaO %	MAF HHV	COAL TONS	TONS OK
PREV. MON	bam92	29.89	4.27	8584	0.26	6.09	12244	0.37	1.69	13038	12974.10	7729.25
PREV. MON	ebm42	30.48	4.77	8454	0.43	6.86	12160	0.62	1.86	13056	14089.13	14089.13
1-Dec-03	0	0	0	0	0	0	0	0	0	0	0.00	
2-Dec-03	0	0	0	0	0	0	0	0	0	0	0.00	
3-Dec-03	bam93	29.3	4.31	8652	0.27	6.1	12237	0.38	1.58	13032	6658.15	6658.15
4-Dec-03	0	0	0	0	0	0	0	0	0	0	0.00	
5-Dec-03	ebm43	29.3	4.85	8575	0.42	6.86	12125	0.6	1.85	13018	14134.15	14134.15
6-Dec-03	0	0	0	0	0	0	0	0	0	0	0.00	
7-Dec-03	0	0	0	0	0	0	0	0	0	0	0.00	
8-Dec-03	0	0	0	0	0	0	0	0	0	0	0.00	
9-Dec-03	ebm44	30	5.25	8419	0.43	7.5	12019	0.62	1.67	12994	11198.31	11198.31
10-Dec-03	0	0	0	0	0	0	0	0	0	0	0.00	
11-Dec-03	0	0	0	0	0	0	0	0	0	0	0.00	
12-Dec-03	ebm45	29.6	5.31	8463	0.44	7.55	12030	0.63	1.58	13012	0.00	
13-Dec-03	0	0	0	0	0	0	0	0	0	0	0.00	
14-Dec-03	0	0	0	0	0	0	0	0	0	0	0.00	
15-Dec-03	0	0	0	0	0	0	0	0	0	0	0.00	
16-Dec-03	0	0	0	0	0	0	0	0	0	0	0.00	
17-Dec-03	0	0	0	0	0	0	0	0	0	0	0.00	
18-Dec-03	0	0	0	0	0	0	0	0	0	0	0.00	
19-Dec-03	0	0	0	0	0	0	0	0	0	0	0.00	
20-Dec-03	0	0	0	0	0	0	0	0	0	0	0.00	
21-Dec-03	0	0	0	0	0	0	0	0	0	0	0.00	
22-Dec-03	ebm46	30.4	4.87	8369	0.4	7	12025	0.57	1.8	12930	8801.65	8801.65
23-Dec-03	0	0	0	0	0	0	0	0	0	0	0.00	
24-Dec-03	0	0	0	0	0	0	0	0	0	0	0.00	
25-Dec-03	0	0	0	0	0	0	0	0	0	0	0.00	
26-Dec-03	0	0	0	0	0	0	0	0	0	0	0.00	
27-Dec-03	ebm47	29.7	4.94	8523	0.44	7.02	12120	0.63	1.89	13035	14139.83	14139.83
28-Dec-03	ebm48	29.9	4.9	8469	0.45	6.99	12087	0.64	1.83	12995	12957.55	12957.55
29-Dec-03	0	0	0	0	0	0	0	0	0	0	0.00	
30-Dec-03	ebm49	29.6	5	8524	0.42	7.11	12109	0.6	1.67	13036	14179.50	1341.83
31-Dec-03	ebm50	29.8	5.15	8470	0.43	7.34	12073	0.61	1.54	13029	12102.48	
ADJ.												91049.85
											Tons. OK	96277.15
Weighted Average		29.89	4.86	8492	0.40	6.93	12113	0.57	1.78		Burn	96277.15

Monthly Mercury Analysis

Train #	Sample #	% Moist.	Mercury ug/g dry basis	Chlor. ug/g
	04-C19	29.76	0.06	<0.01

BIG STONE PLANT COAL ANALYSIS PER TRAIN

Jan-04 PAGE 1

DATE	TR #	MOIS. %	% ASH AR	HHV AR	S, % AR	% ASH DRY	HHV DRY	S, % DRY	NaO %	MAF HHV	COAL TONS	TONS OK
PREV. MO	ebm49	29.61	5.00	8524	0.42	7.11	12109	0.60	1.67	13036	14,179.50	12,837.67
PREV. MO	ebm50	29.84	5.15	8470	0.43	7.34	12073	0.61	1.54	13029	12,102.48	12,102.48
1-Jan-04	0	0	0	0	0	0	0	0	0	0	0.00	
2-Jan-04	0	0	0	0	0	0	0	0	0	0	0.00	
3-Jan-04	0	0	0	0	0	0	0	0	0	0	0.00	
4-Jan-04	0	0	0	0	0	0	0	0	0	0	0.00	
5-Jan-04	ebm01	30.62	4.84	8369	0.42	6.98	12063	0.61	1.79	12968	13,520.10	13,520.10
6-Jan-04	0	0	0	0	0	0	0	0	0	0	0.00	
7-Jan-04	EBM02	30.44	4.72	8432	0.42	6.79	12122	0.6	1.81	13005	13,877.73	13,877.73
8-Jan-04	0	0	0	0	0	0	0	0	0	0	0.00	
9-Jan-04	bam01	29.21	4.7	8608	0.31	6.64	12160	0.44	1.43	13025	13,617.45	13,617.45
10-Jan-04	0	0	0	0	0	0	0	0	0	0	0.00	
11-Jan-04	BAM02	29.45	4.57	8586	0.29	6.48	12145	0.41	1.4	12987	14,168.10	14,168.10
12-Jan-04	0	0	0	0	0	0	0	0	0	0	0.00	
13-Jan-04	bam03	29.39	4.82	8544	0.28	6.83	12100	0.4	1.47	12987	13,734.48	13,734.48
14-Jan-04	0	0	0	0	0	0	0	0	0	0	0.00	
15-Jan-04	bam04	29.37	4.43	8641	0.31	6.27	12234	0.44	1.36	13052	13,762.80	13,762.80
16-Jan-04	0	0	0	0	0	0	0	0	0	0	0.00	
17-Jan-04	ebm03	30.08	4.82	8474	0.43	6.89	12120	0.62	1.77	13017	13,697.98	13,697.98
18-Jan-04	bam05	29.41	4.51	8622	0.28	6.39	12214	0.39	1.73	13048	13,552.10	13,552.10
19-Jan-04	0	0	0	0	0	0	0	0	0	0	0.00	
20-Jan-04	0	0	0	0	0	0	0	0	0	0	0.00	
21-Jan-04	bam06	29.27	4.44	8609	0.3	6.28	12171	0.42	1.45	12987	11,728.30	11,728.30
22-Jan-04	bam07	29.45	4.3	8644	0.25	6.1	12252	0.36	1.65	13048	11,878.50	11,878.50
23-Jan-04	0	0	0	0	0	0	0	0	0	0	0.00	
24-Jan-04	0	0	0	0	0	0	0	0	0	0	0.00	
25-Jan-04	ebm04	29.94	4.95	8498	0.42	7.06	12130	0.6	1.69	13051	13,757.48	13,757.48
26-Jan-04	bam08	29.21	4.5	8650	0.31	6.35	12219	0.44	1.55	13048	13,257.18	13,257.18
27-Jan-04	0	0	0	0	0	0	0	0	0	0	0.00	
28-Jan-04	0	0	0	0	0	0	0	0	0	0	0.00	
29-Jan-04	0	0	0	0	0	0	0	0	0	0	0.00	
30-Jan-04	ebm05	29.96	4.91	8439	0.43	7.01	12049	0.62	1.71	12957	13,733.30	13,733.30
31-Jan-04	0	0	0	0	0	0	0	0	0	0	0.00	
ADJ.												199,225.65
											Tons. OK	199,225.65
Weighted Average		29.69	4.71	8540	0.35	6.70	12143	0.50	1.60		Burn	205,677.43

Monthly Mercury Analysis

Train #	Sample #	% Moist.	Mercury ug/g dry basis	Chloride ug/g
	C53	29.33	0.093	<.01%

BIG STONE PLANT COAL ANALYSIS PER TRAIN

Feb-04 PAGE 1

DATE	TR #	MOIS %	% ASH AR	HHV AR	S, % AR	% ASH DRY	HHV DRY	S, % DRY	NaO %	MAF HHV	COAL TONS	TONS OK
PREV. MON.												
PREV. MON.												
1-Feb-04	bam09	29.4	4.26	8654	0.29	6.03	12260	0.41	1.51	13047	13227.65	13227.65
2-Feb-04	0	0	0	0	0	0	0	0	0	0	0.00	0.00
3-Feb-04	ebm06	29.9	4.92	8522	0.41	7.01	12148	0.59	1.77	13064	13432.30	13432.30
4-Feb-04	0	0	0	0	0	0	0	0	0	0	0.00	0.00
5-Feb-04	bam10	29.4	4.472	8617	0.3	6.26	12211	0.42	1.54	13026	13075.25	13075.25
6-Feb-04	0	0	0	0	0	0	0	0	0	0	0.00	0.00
7-Feb-04	bam11	30	4.33	8526	0.25	6.19	12176	0.36	1.61	12979	13381.70	13381.70
8-Feb-04	0	0	0	0	0	0	0	0	0	0	0.00	0.00
9-Feb-04	ebm07	30.1	5.05	8458	0.43	7.22	12093	0.62	1.66	13034	13135.92	13135.92
10-Feb-04	0	0	0	0	0	0	0	0	0	0	0.00	0.00
11-Feb-04	bam12	29.9	4.34	8575	0.26	6.19	12236	0.37	1.64	13043	13274.80	13274.80
12-Feb-04	0	0	0	0	0	0	0	0	0	0	0.00	0.00
13-Feb-04	bam13	30.7	4.37	8422	0.24	6.31	12149	0.35	1.64	12967	13331.43	13331.43
14-Feb-04	0	0	0	0	0	0	0	0	0	0	0.00	0.00
15-Feb-04	0	0	0	0	0	0	0	0	0	0	0.00	0.00
16-Feb-04	0	0	0	0	0	0	0	0	0	0	0.00	0.00
17-Feb-04	ebm08	30.3	4.88	8447	0.4	7	12117	0.57	1.73	13029	13021.83	13021.83
18-Feb-04	ebm09	29.9	5.02	8485	0.42	7.17	12110	0.6	1.6	13045	13279.58	13279.58
19-Feb-04	0	0	0	0	0	0	0	0	0	0	0.00	0.00
20-Feb-04	0	0	0	0	0	0	0	0	0	0	0.00	0.00
21-Feb-04	ebm10	29.8	4.52	8540	0.42	6.43	12159	0.6	1.99	12995	12493.23	12493.23
22-Feb-04	0	0	0	0	0	0	0	0	0	0	0.00	0.00
23-Feb-04	bam14	29.6	4.63	8560	0.28	6.58	12152	0.4	1.37	13008	13688.70	13688.70
24-Feb-04	0	0	0	0	0	0	0	0	0	0	0.00	0.00
25-Feb-04	ebm11	29.8	5.13	8474	0.39	7.3	12068	0.56	1.84	13018	13864.97	13864.97
26-Feb-04	0	0	0	0	0	0	0	0	0	0	0.00	0.00
27-Feb-04	ebm12	29.4	4.56	8599	0.4	6.46	12173	0.56	1.69	13014	13809.33	10702.49
28-Feb-04	0	0	0	0	0	0	0	0	0	0	0.00	0.00
29-Feb-04	bam15	28.9	4.41	8669	0.25	6.2	12199	0.35	1.58	13005	13969.70	0.00
ADJ.												169909.85
											Tons. OK	193730.75
Weighted Average		29.90	4.76	8508	0.34	6.79	12137	0.49	1.64		Burn	193730.75

Monthly Mercury Analysis

Train #	Sample #	% Moist.	Mercury ug/g dry basis	Chloride ug/g
	C282	29.27	0.035	<.01%

BIG STONE PLANT COAL ANALYSIS PER TRAIN
Mar-04 PAGE 1

DATE	TR #	MOIS. %	% ASH AR	HHV AR	S, % AR	% ASH DRY	HHV DRY	S, % DRY	NaO %	MAF HHV	COAL TONS	TONS OK
PREV.	ebm12	29.4	4.56	8599	0.4	6.46	12173	0.56	1.7	13014	13809.33	5144.23
PREV.	bam15	28.9	4.41	8669	0.25	6.20	12199	0.35	1.58	13005	13969.70	13969.70
1-Mar-04	0	0	0	0	0	0	0	0	0	0	0.00	0.00
2-Mar-04	ebm13	29.76	5.11	8475	0.4	4.27	12066	0.57	1.7	13012	14105.25	14105.25
3-Mar-04	0	0	0	0	0	0	0	0	0	0	0.00	0.00
4-Mar-04	bam16	29.02	4.56	8630	0.29	6.43	12159	0.41	1.4	12995	14068.50	14068.50
5-Mar-04	0	0	0	0	0	0	0	0	0	0	0.00	0.00
6-Mar-04	ebm14	29.11	4.97	8561	0.4	7.01	12077	0.57	1.8	12987	12900.15	12900.15
7-Mar-04	0	0	0	0	0	0	0	0	0	0	0.00	0.00
8-Mar-04	ebm15	30.14	4.69	8477	0.41	6.72	12134	0.58	1.8	13008	13916.08	13916.08
9-Mar-04	0	0	0	0	0	0	0	0	0	0	0.00	0.00
10-Mar-04	ebm16	29.67	4.95	8514	0.4	7.04	12106	0.57	1.7	13023	14113.08	14113.08
11-Mar-04	0	0	0	0	0	0	0	0	0	0	0.00	0.00
12-Mar-04	0	0	0	0	0	0	0	0	0	0	0.00	0.00
13-Mar-04	ebm17	29.95	4.81	8474	0.41	6.87	12097	0.58	1.9	12989	14145.25	14145.25
14-Mar-04	ebm18	29.81	5.1	8488	0.44	7.26	12093	0.63	1.7	13040	12959.98	12959.98
15-Mar-04	0	0	0	0	0	0	0	0	0	0	0.00	0.00
16-Mar-04	ebm19	30.25	4.88	8445	0.4	7	12107	0.58	1.9	13018	14161.93	14161.93
17-Mar-04	0	0	0	0	0	0	0	0	0	0	0.00	0.00
18-Mar-04	bam17	29.51	4.52	8610	0.26	6.41	12215	0.37	1.5	13052	14164.38	14164.38
19-Mar-04	0	0	0	0	0	0	0	0	0	0	0.00	0.00
20-Mar-04	bam18	29.45	4.59	8598	0.27	6.51	12187	0.38	1.5	13036	14141.33	14141.33
21-Mar-04	0	0	0	0	0	0	0	0	0	0	0.00	0.00
22-Mar-04	bam19	29.52	4.25	8635	0.27	6.03	12251	0.39	1.6	13037	14167.70	14167.70
23-Mar-04	0	0	0	0	0	0	0	0	0	0	0.00	0.00
24-Mar-04	0	0	0	0	0	0	0	0	0	0	0.00	0.00
25-Mar-04	bam20	29.54	4.36	8590	0.29	6.19	12192	0.41	1.4	12996	14013.90	14013.90
26-Mar-04	ebm20	30.04	4.75	8462	0.39	6.79	12096	0.56	1.9	12977	14104.75	14104.75
27-Mar-04	0	0	0	0	0	0	0	0	0	0	0.00	0.00
28-Mar-04	0	0	0	0	0	0	0	0	0	0	0.00	0.00
29-Mar-04	bam021	28.73	4.32	8753	0.26	6.06	12281	0.36	1.5	13073	14160.13	9961.47
30-Mar-04	ebm021	29.8	4.83	8526	0.4	6.88	12145	0.57	1.9	13042	12955.50	
31-Mar-04	0	0	0	0	0	0	0	0	0	0	0.00	0.00
ADJ.												210037.66
											Tons. OK	210037.66
Weighted Average		29.58	4.69	8556	0.34	6.45	12149	0.49	1.66		Burn	210037.66

Monthly Mercury Analysis

Train #	Sample #	% Moist.	Mercury ug/g dry basis	Chloride ug/g

BIG STONE PLANT COAL ANALYSIS PER TRAIN
Apr-04

DATE	TR #	MOIS. %	% ASH AR	HHV AR	S, % AR	% ASH DRY	HHV DRY	S, % DRY	NaO %	MAF HHV	COAL TONS	TONS OK
PREV. MON.	bam021	28.73	4.32	8753	0.26	6.06	12281	0.36	1.5	13073	14160.13	4198.66
PREV. MON.	ebm021	29.8	4.83	8526	0.4	6.88	12145	0.57	1.9	13042	12955.50	12955.50
1-Apr-04	0	0	0.00	0	0	0	0	0	0	0	0.00	
2-Apr-04	0	0	0.00	0	0	0	0	0	0	0	0.00	
3-Apr-04	bam22	29.18	4.29	8626	0.27	6.06	12180	0.38	1.5	12966	14160.98	14160.98
4-Apr-04	bam23	28.84	4.64	8625	0.3	6.52	12121	0.42	1.4	12966	13350.00	13350.00
5-Apr-04	0	0	0.00	0	0	0	0	0	0	0	0.00	
6-Apr-04	0	0	0.00	0	0	0	0	0	0	0	0.00	
7-Apr-04	bam24	28.87	5.08	8607	0.29	7.14	12100	0.41	1.3	13030	9835.43	9835.43
8-Apr-04	bam25	28.87	4.87	8669	0.32	6.84	12187	0.45	1.4	13082	13773.15	13773.15
9-Apr-04	0	0	0.00	0	0	0	0	0	0	0	0.00	
10-Apr-04	bam026	28.83	4.85	8651	0.3	6.82	12156	0.42	1.4	13046	14166.35	14166.35
11-Apr-04	bam27	28.89	4.71	8622	0.28	6.63	12125	0.4	1.5	12986	13800.53	13800.53
12-Apr-04	0	0	0.00	0	0	0	0	0	0	0	0.00	
13-Apr-04	0	0	0.00	0	0	0	0	0	0	0	0.00	
14-Apr-04	bam28	29.3	4.34	8628	0.27	6.14	12204	0.38	1.6	13002	14140.08	14140.08
15-Apr-04	bam29	28.83	4.36	8672	0.26	6.12	12185	0.37	1.5	12979	9536.70	9536.70
16-Apr-04	0	0	0.00	0	0	0	0	0	0	0	0.00	
17-Apr-04	0	0	0.00	0	0	0	0	0	0	0	0.00	
18-Apr-04	ebm22	29.72	4.99	8478	0.39	7.1	12063	0.56	1.7	12985	13080.60	13080.60
19-Apr-04	0	0	0.00	0	0	0	0	0	0	0	0.00	
20-Apr-04	bam30	29.69	4.20	8618	0.26	5.98	12257	0.37	1.5	13037	12762.73	12762.73
21-Apr-04	0	0	0.00	0	0	0	0	0	0	0	0.00	
22-Apr-04	0	0	0.00	0	0	0	0	0	0	0	0.00	
23-Apr-04	ebm23	30.3	4.77	8474	0.39	6.84	12158	0.56	1.9	13051	14181.68	14181.68
24-Apr-04	0	0	0.00	0	0	0	0	0	0	0	0.00	
25-Apr-04	bam31	29.12	4.66	8595	0.26	6.57	12126	0.37	1.5	12979	14163.73	14163.73
26-Apr-04	0	0	0.00	0	0	0	0	0	0	0	0.00	
27-Apr-04	0	0	0.00	0	0	0	0	0	0	0	0.00	
28-Apr-04	ebm24	29.83	4.77	8525	0.44	6.8	12149	0.62	2	13035	12989.30	11789.97
29-Apr-04	bam32	28.56	4.24	8684	0.27	5.94	12156	0.38	1.5	12924	14149.70	
30-Apr-04	0	0	0.00	0	0	0	0	0	0	0	0.00	
ADJ.												185896.06
											Tons. OK	185896.06
Weighted Average		29.29	4.66	8597	0.32	6.59	12157	0.45	1.58		Burn	185896.05

Monthly Mercury Analysis

Train #	Sample #	% Moist.	Mercury ug/g dry basis	Chloride ug/g
		30.14	0.116	<0.01

BIG STONE PLANT COAL ANALYSIS PER TRAIN
May-04

DATE	TR #	MOIS. %	% ASH AR	HHV AR	S, % AR	% ASH DRY	HHV DRY	S, % DRY	NaO %	MAF HHV	COAL TONS	TONS OK
PREV. MO	ebm24	29.83	4.77	8525	0.44	6.8	12149	0.62	1.98	13035	12989.300	1199.330
PREV. MO	bam32	28.56	4.24	8684	0.27	5.94	12156	0.38	1.51	12924	14149.700	14149.700
1-May-04	0	0	0	0	0	0	0	0	0	0	0.000	
2-May-04	ebm25	30.32	4.93	8396	0.4	7.07	12050	0.57	1.82	12967	14183.200	14183.200
3-May-04	bam33	29.16	4.28	8647	0.23	6.04	12207	0.33	1.48	12992	14158.475	14158.475
4-May-04	0	0	0	0	0	0	0	0	0	0	0.000	
5-May-04	bam034	29.17	4.32	8693	0.28	6.1	12273	0.4	1.57	13070	12965.900	12965.900
6-May-04	0	0	0	0	0	0	0	0	0	0	0.000	
7-May-04	0	0	0	0	0	0	0	0	0	0	0.000	
8-May-04	bam35	29.4	4.38	8587	0.29	6.2	12163	0.41	1.55	12967	12720.880	12720.880
9-May-04	0	0	0	0	0	0	0	0	0	0	0.000	
10-May-04	bam36	29.83	4.13	8578	0.27	5.89	12225	0.39	1.4	12990	14149.800	14149.800
11-May-04	0	0	0	0	0	0	0	0	0	0	0.000	
12-May-04	bam37	29.88	4.53	8511	0.31	6.46	12138	0.44	1.46	12976	14167.225	14167.225
13-May-04	0	0	0	0	0	0	0	0	0	0	0.000	
14-May-04	bam38	29.56	4.61	8594	0.3	6.55	12201	0.42	1.47	13056	14157.850	14157.850
15-May-04	0	0	0	0	0	0	0	0	0	0	0.000	
16-May-04	bam39	29.55	4.35	8643	0.29	6.18	12268	0.41	1.54	13076	14156.550	14156.550
17-May-04	0	0	0	0	0	0	0	0	0	0	0.000	
18-May-04	0	0	0	0	0	0	0	0	0	0	0.000	
19-May-04	bam40	29.59	4.63	8563	0.3	6.57	12161	0.43	1.56	13016	14149.900	14149.900
20-May-04	ebm26	30.26	4.94	8406	0.38	7.09	12053	0.55	1.72	12973	14187.275	14187.275
21-May-04	0	0	0	0	0	0	0	0	0	0	0.000	
22-May-04	0	0	0	0	0	0	0	0	0	0	0.000	
23-May-04	bam041	29.12	4.69	8581	0.33	6.61	12107	0.46	1.4	12964	14151.225	14151.225
24-May-04	ebm027	30.78	4.81	8386	0.41	6.95	12115	0.59	1.8	13020	13105.525	13105.525
25-May-04	0	0	0	0	0	0	0	0	0	0	0.000	
26-May-04	0	0	0	0	0	0	0	0	0	0	0.000	
27-May-04	ebm028	30.36	4.68	8431	0.41	6.72	12106	0.59	1.76	12978	14151.046	14151.046
28-May-04	0	0	0	0	0	0	0	0	0	0	0.000	
29-May-04	0	0	0	0	0	0	0	0	0	0	0.000	
30-May-04	ebm029	30.33	4.65	8445	0.41	6.68	12121	0.59	1.86	12989	14205.600	7954.379
31-May-04	ebm30	29.78	4.63	8500	0.39	6.6	12105	0.56	1.7	12960	14201.880	
ADJ.												203708.260
											Tons. OK	203708.260
Weighted Average		29.71	4.54	8545	0.32	6.47	12157	0.46	1.59		Burn	203708.260

Monthly Mercury Analysis

Train #	Sample #	% Moist.	Mercury ug/g dry basis	Chloride ug/g
	C817	29.19	0.086	<0.01

BIG STONE PLANT COAL ANALYSIS PER TRAIN
Jun-04

DATE	TR #	MOIS. %	% ASH AR	HHV AR	S, % AR	% ASH DRY	HHV DRY	S, % DRY	NaO %	MAF HHV	COAL TONS	TONS OK
PREV. MO	ebm029	30.33	4.65	8445	0.41	6.68	12121	0.59	1.9	12989	14205.600	6251.221
PREV. MO	ebm30	29.78	4.63	8500	0.39	6.6	12105	0.56	1.7	12960	14201.880	
1-Jun-04	0	0	0	0	0	0	0	0	0	0	0.00	
2-Jun-04	0	0	0	0	0	0	0	0	0	0	0.00	
3-Jun-04	ebm031	30.21	4.76	8443	0.38	6.82	12098	0.55	1.7	12983	14154.15	14154.15
4-Jun-04	0	0	0	0	0	0	0	0	0	0	0.00	
5-Jun-04	0	0	0	0	0	0	0	0	0	0	0.00	
6-Jun-04	0	0	0	0	0	0	0	0	0	0	0.00	
7-Jun-04	0	0	0	0	0	0	0	0	0	0	0.00	
8-Jun-04	0	0	0	0	0	0	0	0	0	0	0.00	
9-Jun-04	0	0	0	0	0	0	0	0	0	0	0.00	
10-Jun-04	0	0	0	0	0	0	0	0	0	0	0.00	
11-Jun-04	0	0	0	0	0	0	0	0	0	0	0.00	
12-Jun-04	0	0	0	0	0	0	0	0	0	0	0.00	
13-Jun-04	0	0	0	0	0	0	0	0	0	0	0.00	
14-Jun-04	0	0	0	0	0	0	0	0	0	0	0.00	
15-Jun-04	0	0	0	0	0	0	0	0	0	0	0.00	
16-Jun-04	ebm32	29.94	4.84	8474	0.39	6.91	12096	0.56	1.7	12994	13927.43	13927.43
17-Jun-04	ebm33	29.35	4.87	8544	0.39	6.9	12094	0.55	1.9	12990	13905.63	13905.63
18-Jun-04	0	0	0	0	0	0	0	0	0	0	0.00	
19-Jun-04	0	0	0	0	0	0	0	0	0	0	0.00	
20-Jun-04	0	0	0	0	0	0	0	0	0	0	0.00	
21-Jun-04	ebm34	30.22	4.58	8429	0.36	6.56	12079	0.52	1.8	12927	14156.00	14156.00
22-Jun-04	ebm35	30.23	4.84	8440	0.43	6.93	12097	0.62	1.8	12998	12427.50	12427.00
23-Jun-04	0	0	0	0	0	0	0	0	0	0	0.00	
24-Jun-04	0	0	0	0	0	0	0	0	0	0	0.00	
25-Jun-04	ebm36	30.08	4.59	8479	0.41	6.57	12127	0.58	1.8	12980	10909.80	10909.80
26-Jun-04	ebm37	30.21	4.63	8454	0.37	6.64	12113	0.53	1.8	12975	14144.95	14144.95
27-Jun-04	0	0	0	0	0	0	0	0	0	0	0.00	
28-Jun-04	ebm38	29.61	4.86	8526	0.43	6.9	12112	0.61	1.7	13010	13080.90	13080.90
29-Jun-04	0	0	0	0	0	0	0	0	0	0	0.00	
30-Jun-04	ebm39	29.49	4.81	8523	0.38	6.82	12088	0.54	1.8	12973	9476.88	5174.24
ADJ.												118131.32
											Tons. OK	136424.42
Weighted Avg.		30.01	4.85	8460	0.38	6.93	12087	0.55	1.73		Burn	136424.32

Monthly Mercury Analysis

Train #	Sample #	% Moist.	Mercury ug/g dry basis	Chloride ug/g
	C1045	28.75	0.154	<0.01

BIG STONE PLANT COAL ANALYSIS PER TRAIN
Jul-04

DATE	TR #	MOIS %	% ASI AR	HHV AR	S, % AR	% ASH DRY	HHV DRY	S, % DRY	NaO %	MAF HHV	COAL TONS	TONS OK
PREV. MC	ebm39	29.5	4.81	8523	0.38	6.82	12088	0.54	1.75	12973	9476.88	4302.64
PREV. MON.												
1-Jul-04	0	0	0	0	0	0	0	0	0	0	0.00	
2-Jul-04	ebm40	29.5	4.71	8490	0.39	6.67	12036	0.55	1.77	12896	14152.83	14152.83
3-Jul-04	0	0	0	0	0	0	0	0	0	0	0.00	
4-Jul-04	ebm41	29.7	4.88	8526	0.43	6.94	12124	0.61	1.71	13028	13310.50	13310.50
5-Jul-04	0	0	0	0	0	0	0	0	0	0	0.00	
6-Jul-04	0	0	0	0	0	0	0	0	0	0	0.00	
7-Jul-04	bam42	28.8	4.49	8692	0.3	6.3	12203	0.42	1.49	13023	10669.50	10669.50
8-Jul-04	ebm42	30.3	4.61	8450	0.36	6.62	12127	0.52	1.77	12987	10166.70	10166.70
9-Jul-04	0	0	0	0	0	0	0	0	0	0	0.00	
10-Jul-04	0	0	0	0	0	0	0	0	0	0	0.00	
11-Jul-04	cdm01	30.6	4.68	8427	0.31	6.74	12136	0.44	1.72	13013	14199.90	14199.90
12-Jul-04	0	0	0	0	0	0	0	0	0	0	0.00	
13-Jul-04	ebm43	29.9	4.63	8500	0.4	6.6	12118	0.57	1.82	12974	14179.18	14179.18
14-Jul-04	0	0	0	0	0	0	0	0	0	0	0.00	
15-Jul-04	0	0	0	0	0	0	0	0	0	0	0.00	
16-Jul-04	0	0	0	0	0	0	0	0	0	0	0.00	
17-Jul-04	cdm02	29.4	5	8508	0.31	7.09	12052	0.45	1.18	12972	14174.55	14174.55
18-Jul-04	0	0	0	0	0	0	0	0	0	0	0.00	
19-Jul-04	ebm44	30.4	4.66	8418	0.37	6.7	12098	0.53	1.89	12967	14167.80	14167.80
20-Jul-04	0	0	0	0	0	0	0	0	0	0	0.00	
21-Jul-04	cdm03	30.3	4.83	8411	0.3	6.93	12072	0.43	1.19	12971	11770.80	11770.80
22-Jul-04	0	0	0	0	0	0	0	0	0	0	0.00	
23-Jul-04	0	0	0	0	0	0	0	0	0	0	0.00	
24-Jul-04	0	0	0	0	0	0	0	0	0	0	0.00	
25-Jul-04	0	0	0	0	0	0	0	0	0	0	0.00	
26-Jul-04	ebm45	30	4.44	8480	0.38	6.34	12116	0.55	1.82	12936	14159.33	14159.33
27-Jul-04	ebm46	29.9	4.52	8499	0.39	6.44	12115	0.56	1.94	12949	14174.38	14174.38
28-Jul-04	0	0	0	0	0	0	0	0	0	0	0.00	
29-Jul-04	0	0	0	0	0	0	0	0	0	0	0.00	
30-Jul-04	0	0	0	0	0	0	0	0	0	0	0.00	
31-Jul-04	ebm047	30.1	4.72	8436	0.42	6.75	12075	0.6	1.64	12949	14169.90	14169.90
ADJ.												163598.01
											Tons. OK	163598.01
Weighted Average		29.90	4.69	8485	0.37	6.68	12103	0.52	1.67		Burn	168366.77

Monthly Mercury Analysis

Train #	Sample #	% Moist.	Mercury ug/g dry basis	Chloride ug/g
	C1192	29.54	0.111	<0.01

BIG STONE PLANT COAL ANALYSIS PER TRAIN
Aug-04

DATE	TR #	MOIS %	% ASH AR	HHV AR	S, % AR	% ASH DRY	HHV DRY	S, % DRY	NaO %	MAF HHV	COAL TONS	TONS OK
PREV. MON.												
PREV. MON.												
1-Aug-04	cdm04	30.0	5.09	8460	0.36	7.28	12089	0.43	1.34	13038	14198.90	14198.90
2-Aug-04	0	0.0	0	0	0	0	0	0	0	0	0.00	
3-Aug-04	0	0.0	0	0	0	0	0	0	0	0	0.00	
4-Aug-04	ebm48	30.0	4.64	8506	0.4	6.63	12155	0.57	1.77	13018	14168.05	14168.05
5-Aug-04	0	0.0	0	0	0	0	0	0	0	0	0.00	
6-Aug-04	0	0.0	0	0	0	0	0	0	0	0	0.00	
7-Aug-04	cdm05	28.6	6.13	8486	0.28	8.57	11877	0.39	1.2	12990	14198.73	14198.73
8-Aug-04	ebm49	30.2	4.76	8451	0.44	6.82	12102	0.63	1.75	12988	14178.08	14178.08
9-Aug-04	0	0.0	0	0	0	0	0	0	0	0	0.00	
10-Aug-04	0	0.0	0	0	0	0	0	0	0	0	0.00	
11-Aug-04	0	0.0	0	0	0	0	0	0	0	0	0.00	
12-Aug-04	cdm06	29.5	5.86	8381	0.32	8.32	11893	0.46	1.3	12972	11763.95	11763.95
13-Aug-04	0	0.0	0	0	0	0	0	0	0	0	0.00	
14-Aug-04	ebm50	30.1	4.74	8435	0.42	6.78	12059	0.6	1.82	12936	14184.80	14184.80
15-Aug-04	0	0.0	0	0	0	0	0	0	0	0	0.00	
16-Aug-04	cdm07	29.3	6.08	8425	0.29	8.59	11912	0.41	1.2	13032	14163.98	14163.98
17-Aug-04	0	0.0	0	0	0	0	0	0	0	0	0.00	
18-Aug-04	ebm51	30.5	4.58	8391	0.37	6.59	12068	0.53	1.85	12919	14179.95	14179.95
19-Aug-04	0	0.0	0	0	0	0	0	0	0	0	0.00	
20-Aug-04	0	0.0	0	0	0	0	0	0	0	0	0.00	
21-Aug-04	crm01	28.6	5.56	8598	0.33	12.64	12038	0.46	1.17	13055	12998.88	12998.88
22-Aug-04	0	0.0	0	0	0	0	0	0	0	0	0.00	
23-Aug-04	ebm52	30.6	4.71	8376	0.42	6.78	12065	0.6	1.74	12943	14198.60	14198.60
24-Aug-04	0	0.0	0	0	0	0	0	0	0	0	0.00	
25-Aug-04	0	0.0	0	0	0	0	0	0	0	0	0.00	
26-Aug-04	crm02	29.3	4.68	8601	0.27	6.61	12159	0.39	1.46	13020	14216.60	14216.60
27-Aug-04	bam43	29.3	4.53	8569	0.26	6.41	12122	0.37	1.59	12952	13139.60	13139.60
28-Aug-04	0	0.0	0	0	0	0	0	0	0	0	0.00	
29-Aug-04	0	0.0	0	0	0	0	0	0	0	0	0.00	
30-Aug-04	0	0.0	0	0	0	0	0	0	0	0	0.00	
31-Aug-04	crm03	29.6	5.61	8482	0.33	7.97	12056	0.47	1.33	13101	10940.73	10940.73
												176530.85
											Tons. OK	176530.85
Weighted Average		29.66	5.13	8474	0.35	7.65	12047	0.49	1.51		Burn	179102.36

Monthly Mercury Analysis

Train #	Sample #	% Moist.	Mercury ug/g dry basis	Chlor. ug/g
	C1446	29.01	0.144	<0.01

BIG STONE PLANT	COAL ANALYSIS PER TRAIN	
	Sep-04	PAGE 1 of 2

DATE	TR #	MOIS. %	% ASH AR	HHV AR	S, % AR	% ASH DRY	HHV DRY	S, % DRY	NaO %	MAF HHV	COAL TONS	TONS OK
PREV. MON.												
PREV. MON.												
1-Sep-04	ebm53	30.58	4.56	8400	0.4	6.57	12100	0.58	1.69	12951	14172.68	14172.68
2-Sep-04	0	0	0	0	0	0	0	0	0	0	0.00	
3-Sep-04	0	0	0	0	0	0	0	0	0	0	0.00	
4-Sep-04	crm04	29.52	5.14	8530	0.31	7.29	12101	0.43	1.39	13053	12884.68	12884.68
5-Sep-04	bam44	29.61	4.52	8559	0.3	6.42	12159	0.42	1.44	12993	13963.63	13963.63
6-Sep-04	0	0	0	0	0	0	0	0	0	0	0.00	
7-Sep-04	0	0	0	0	0	0	0	0	0	0	0.00	
8-Sep-04	crm05	29.63	4.78	8581	0.26	6.79	12194	0.38	1.4	13082	14217.38	14217.38
9-Sep-04	0	0	0	0	0	0	0	0	0	0	0.00	
10-Sep-04	ebm54	29.95	4.85	8499	0.42	6.92	12133	0.6	1.88	13035	13936.85	13936.85
11-Sep-04	0	0	0	0	0	0	0	0	0	0	0.00	
12-Sep-04	0	0	0	0	0	0	0	0	0	0	0.00	
13-Sep-04	0	0	0	0	0	0	0	0	0	0	0.00	
14-Sep-04	bam45	29.18	4.76	8555	0.29	6.72	12080	0.41	1.44	12950	14152.68	14152.68
15-Sep-04	0	0	0	0	0	0	0	0	0	0	0.00	
16-Sep-04	ebm55	30.64	4.81	8387	0.41	6.93	12092	0.59	1.79	12992	14181.33	14181.33
17-Sep-04	0	0	0	0	0	0	0	0	0	0	0.00	
18-Sep-04	bam46	29.06	4.66	8632	0.31	6.57	12168	0.43	1.44	13024	13790.93	13790.93
19-Sep-04	0	0	0	0	0	0	0	0	0	0	0.00	
20-Sep-04	0	0	0	0	0	0	0	0	0	0	0.00	
21-Sep-04	ebm056	30.69	4.49	8356	0.28	6.48	12056	0.4	1.73	12891	14187.80	14187.80
22-Sep-04	0	0	0	0	0	0	0	0	0	0	0.00	
23-Sep-04	bam47	29.44	4.35	8642	0.28	6.16	12248	0.39	1.64	13052	14158.50	14158.50
24-Sep-04	0	0	0	0	0	0	0	0	0	0	0.00	
25-Sep-04	0	0	0	0	0	0	0	0	0	0	0.00	
26-Sep-04	bam48	30.16	4.23	8534	0.23	6.05	12220	0.33	1.53	13007	14160.30	14160.30
27-Sep-04	ebm57	30.3	4.6	8455	0.42	6.6	12131	0.6	1.84	12988	14299.65	14299.65
28-Sep-04	0	0	0	0	0	0	0	0	0	0	0.00	
29-Sep-04	0	0	0	0	0	0	0	0	0	0	0.00	
30-Sep-04	ebm58	30.16	4.62	8484	0.41	6.61	12148	0.58	1.7	13008	13696.73	6046.72
ADJ.												174153.13
											Tons. OK	178154.23
Weighted Average		29.92	4.66	8506	0.33	6.65	12137	0.47	1.60		Burn	178154.23

Monthly Mercury Analysis

Train #	Sample #	% Moist.	Mercury ug/g dry basis	Chlor. ug/g

BIG STONE PLANT COAL ANALYSIS PER TRAIN
Oct-04 PAGE 1 of 2

DATE	TR #	MOIS. %	% ASH AR	HHV AR	S, % AR	% ASH DRY	HHV DRY	S, % DRY	NaO %	MAF HHV	COAL TONS	TONS OK
PREV. MON.												
PREV. MON.	ebm58	30.16	4.62	8484	0.41	6.61	12148	0.58	1.70	13008	13696.725	7650.005
1-Oct-04	0	0	0	0	0	0	0	0	0	0	0.000	
2-Oct-04	ebm59	30.39	4.86	8412	0.43	6.98	12085	0.62	1.69	12992	13567.950	13567.950
3-Oct-04	0	0	0	0	0	0	0	0	0	0	0.000	
4-Oct-04	bam49	29.72	4.67	8496	0.25	6.65	12089	0.36	1.51	12950	13918.450	13918.450
5-Oct-04	0	0	0	0	0	0	0	0	0	0	0.000	
6-Oct-04	ebm60	30.49	4.68	8430	0.42	6.74	12128	0.61	1.77	13005	14173.825	14173.825
7-Oct-04	0	0	0	0	0	0	0	0	0	0	0.000	
8-Oct-04	0	0	0	0	0	0	0	0	0	0	0.000	
9-Oct-04	ebm61	30.2	4.78	8433	0.42	6.85	12082	0.6	1.75	12970	14191.575	14191.575
10-Oct-04	0	0	0	0	0	0	0	0	0	0	0.000	
11-Oct-04	ebm62	30.1	4.73	8438	0.43	6.77	12071	0.62	1.81	12948	14184.350	14184.350
12-Oct-04	0	0	0	0	0	0	0	0	0	0	0.000	
13-Oct-04	0	0	0	0	0	0	0	0	0	0	0.000	
14-Oct-04	bam50	29.61	5.09	8514	0.28	7.23	12095	0.4	1.31	13038	14152.525	14152.525
15-Oct-04	ebm63	30.32	4.78	8443	0.42	6.86	12117	0.6	1.74	13009	14171.875	14171.875
16-Oct-04	0	0	0	0	0	0	0	0	0	0	0.000	
17-Oct-04	0	0	0	0	0	0	0	0	0	0	0.000	
18-Oct-04	0	0	0	0	0	0	0	0	0	0	0.000	
19-Oct-04	bam51	29.03	4.72	8585	0.28	6.65	12096	0.39	1.36	12958	12922.100	12922.100
20-Oct-04	ebm64	30.95	4.76	8349	0.41	6.9	12091	0.6	1.68	12987	14183.500	14183.500
21-Oct-04	0	0	0	0	0	0	0	0	0	0	0.000	
22-Oct-04	0	0	0	0	0	0	0	0	0	0	0.000	
23-Oct-04	0	0	0	0	0	0	0	0	0	0	0.000	
24-Oct-04	0	0	0	0	0	0	0	0	0	0	0.000	
25-Oct-04	0	0	0	0	0	0	0	0	0	0	0.000	
26-Oct-04	0	0	0	0	0	0	0	0	0	0	0.000	
27-Oct-04	0	0	0	0	0	0	0	0	0	0	0.000	
28-Oct-04	0	0	0	0	0	0	0	0	0	0	0.000	
29-Oct-04	ebm65	30.4	4.68	8417	0.37	6.72	12093	0.53	1.72	12964	13649.830	12924.825
30-Oct-04	0	0	0	0	0	0	0	0	0	0	0.000	
31-Oct-04	0	0	0	0	0	0	0	0	0	0	0.000	
ADJ.											139115.980	146040.980
											Tons. OK	146040.980
Weighted Average		30.13	4.77	8453	0.37	6.83	12098	0.54	1.64		Burn	146040.980

Monthly Mercury Analysis

Train #	Sample #	% Moist.	Mercury ug/g dry basis	Chlor. ug/g

BIG STONE PLANT — COAL ANALYSIS PER TRAIN
Nov-04 — PAGE 1 of 2

DATE	TR #	MOIS. %	% ASH AR	HHV AR	S, % AR	% ASH DRY	HHV DRY	S, % DRY	NaO %	MAF HHV	COAL TONS	TONS OK
PREV. MON.												
PREV. MON	ebm65	30.4	4.68	8417	0.37	6.72	12093	0.53	1.7	12964	13649.83	725.01
1-Nov-04	0	0	0	0	0	0	0	0	0	0	0.00	
2-Nov-04	0	0	0	0	0	0	0	0	0	0	0.00	
3-Nov-04	ebm66	30.32	4.88	8449	0.4	7	12125	0.58	1.7	13038	13933.15	13933.15
4-Nov-04	0	0	0	0	0	0	0	0	0	0	0.00	
5-Nov-04	bam52	29.68	4.2	8621	0.26	5.97	12260	0.37	1.6	13038	13423.35	13423.35
6-Nov-04	0	0	0	0	0	0	0	0	0	0	0.00	
7-Nov-04	bam53	29.82	4.38	8584	0.27	6.24	12231	0.38	1.5	13045	14140.08	14140.08
8-Nov-04	0	0	0	0	0	0	0	0	0	0	0.00	
9-Nov-04	0	0	0	0	0	0	0	0	0	0	0.00	
10-Nov-04	bam54	28.96	4.38	8688	0.28	6.17	12230	0.4	1.5	13034	13916.23	13916.23
11-Nov-04	0	0	0	0	0	0	0	0	0	0	0.00	
12-Nov-04	bam55	28.86	4.67	8684	0.28	6.57	12207	0.4	1.6	13065	13788.00	13788.00
13-Nov-04	0	0	0	0	0	0	0	0	0	0	0.00	
14-Nov-04	bam56	29.03	4.66	8619	0.31	6.56	12145	0.44	1.4	12998	12956.32	12956.32
15-Nov-04	0	0	0	0	0	0	0	0	0	0	0.00	
16-Nov-04	ebm67	30.21	4.59	8476	0.4	6.58	12145	0.57	1.9	13000	13781.35	13781.35
17-Nov-04	0	0	0	0	0	0	0	0	0	0	0.00	
18-Nov-04	ebm68	30.14	5.07	8401	0.41	7.26	12025	0.58	1.6	12966	13174.40	13174.40
19-Nov-04	0	0	0	0	0	0	0	0	0	0	0.00	
20-Nov-04	0	0	0	0	0	0	0	0	0	0	0.00	
21-Nov-04	ebm69	30.33	4.75	8395	0.42	6.82	12050	0.61	1.8	12932	14172.05	14172.05
22-Nov-04	0	0	0	0	0	0	0	0	0	0	0.00	
23-Nov-04	bam57	30.47	4.1	8508	0.24	5.9	12237	0.35	1.5	13004	14144.88	14144.88
24-Nov-04	0	0	0	0	0	0	0	0	0	0	0.00	
25-Nov-04	bam58	29.42	4.52	8592	0.29	6.41	12174	0.41	1.5	13008	13937.98	13937.98
26-Nov-04	0	0	0	0	0	0	0	0	0	0	0.00	
27-Nov-04	bam59	29.24	4.26	8614	0.25	6.02	12174	0.36	1.5	12954	14023.20	14023.20
28-Nov-04	0	0	0	0	0	0	0	0	0	0	0.00	
29-Nov-04	0	0	0	0	0	0	0	0	0	0	0.00	
30-Nov-04	bam60	29.66	4.71	8552	0.27	6.86	12158	0.39	1.4	13030	14061.93	9015.08
ADJ.												175131.08
											Tons. OK	192225.48
Weighted Average		29.75	4.63	8535	0.31	6.60	12151	0.45	1.58		Burn	192225.48

Monthly Mercury Analysis

Train #	Sample #	% Moist.	Mercury ug/g dry basis	Chlor. ug/g

BIG STONE PLANT COAL ANALYSIS PER TRAIN

Dec-04

DATE	TR #	MOIS %	% ASH AR	HHV AR	S, % AR	% ASH DRY	HHV DRY	S, % DRY	NaO %	MAF HHV	COAL TONS	TONS OK
PREV. MON.												
PREV. MON.												
1-Dec-04	0	0	0	0	0	0	0	0	0	0	0.00	
2-Dec-04	bam61	29.1	4.85	8606	0.26	6.84	12145	0.36	1.21	13037	13904.43	13904.43
3-Dec-04	0	0	0	0	0	0	0	0	0	0	0.00	
4-Dec-04	bam62	29.3	4.56	8598	0.26	6.45	12164	0.37	1.49	13003	13886.65	13886.65
5-Dec-04	0	0	0	0	0	0	0	0	0	0	0.00	
6-Dec-04	0	0	0	0	0	0	0	0	0	0	0.00	
7-Dec-04	bam63	29.8	4.23	8586	0.24	6.03	12227	0.34	1.58	13012	12743.53	12743.53
8-Dec-04	bam64	29.5	4.17	8652	0.25	5.92	12269	0.35	1.57	13041	14136.03	14136.03
9-Dec-04	0	0	0	0	0	0	0	0	0	0	0.00	
10-Dec-04	0	0	0	0	0	0	0	0	0	0	0.00	
11-Dec-04	ebm70	30.2	4.93	8401	0.43	7.06	12041	0.61	1.7	12956	14169.73	14169.73
12-Dec-04	bam65	29.5	4.63	8580	0.27	6.56	12168	0.38	1.44	13022	14133.78	14133.78
13-Dec-04	0	0	0	0	0	0	0	0	0	0	0.00	
14-Dec-04	0	0	0	0	0	0	0	0	0	0	0.00	
15-Dec-04	ebm71	30.4	5.12	8410	0.4	7.36	12088	0.57	1.6	13048	13872.93	13872.93
16-Dec-04	0	0	0	0	0	0	0	0	0	0	0.00	
17-Dec-04	0	0	0	0	0	0	0	0	0	0	0.00	
18-Dec-04	0	0	0	0	0	0	0	0	0	0	0.00	
19-Dec-04	bam66	29.2	4.27	8644	0.27	6.03	12207	0.38	1.57	12990	14158.68	14158.68
20-Dec-04	bam67	29.1	4.65	8668	0.32	6.56	12227	0.45	1.43	13085	14117.58	14117.58
21-Dec-04	0	0	0	0	0	0	0	0	0	0	0.00	
22-Dec-04	0	0	0	0	0	0	0	0	0	0	0.00	
23-Dec-04	ebm72	30.6	5.01	8369	0.4	7.21	12056	0.58	1.61	12993	13567.68	13567.68
24-Dec-04	ebm73	30.2	4.78	8421	0.38	6.85	12061	0.55	1.69	12948	13703.60	13703.60
25-Dec-04	0	0	0	0	0	0	0	0	0	0	0.00	
26-Dec-04	0	0	0	0	0	0	0	0	0	0	0.00	
27-Dec-04	bam68	29.1	4.32	8703	0.26	6.09	12275	0.36	1.46	13071	13384.08	13384.08
28-Dec-04	ebm74	30.2	4.62	8437	0.42	6.62	12094	0.6	1.76	12951	13473.63	13473.63
29-Dec-04	0	0	0	0	0	0	0	0	0	0	0.00	
30-Dec-04	ebm75	30.2	4.38	8485	0.4	6.28	12159	0.57	1.86	12974	13891.23	11869.01
31-Dec-04	bam69	29.4	4.59	8595	0.25	6.5	12172	0.35	1.5	13018	12581.33	0.00
ADJ.												191121.34
											Tons. OK	201529.44
Weighted Average		29.77	4.66	8532	0.32	6.63	12147	0.46	1.56		Burn	201529.44

Monthly Mercury Analysis

Train #	Sample #	% Moist.	Mercury ug/g dry basis	Chlor. ug/g
	C2384	29.62	0.08	<0.01

B16 Ash and Alternative Fuel Analysis Records

JAN.27.2003 11:25AM COMM/CHPT NO.323 P.3/4

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January 10, 2003

RAG COAL WEST, INC.
EAGLE BUTTE MINE
P.O. BOX 3040
GILLETTE WY 82717

Sample identification by
RAG Coal West, Inc.

SAMPLE ID:	36-114564
TRAIN #:	BSB041
TOTAL TONNAGE:	14145.225
CUSTOMER:	OTTERTAIL POWER
PLANT:	BIG STONE
LOAD DATE:	12/31/2002

Kind of sample reported to us: COAL

Sample taken at: Eagle Butte

Sample taken by: Eagle Butte

Date sampled: December 31, 2002

Date received: January 10, 2003

Analysis report no. 44-59398

ANALYSIS OF ASH	% Weight Ignited Basis
Silica, SiO_2	29.92
Alumina, Al_2O_3	16.85
Titania, TiO_2	1.23
Ferric Oxide, Fe_2O_3	5.33
Lime, CaO	26.82
Magnesia, MgO	6.49
Potassium Oxide, K_2O	0.23
Sodium Oxide, Na_2O	1.81
Sulfur Trioxide, SO_3	11.00
Phosphorous Pentoxide, P_2O_5	0.59
Strontium Oxide, SrO	0.63
Barium Oxide, BaO	0.64
Manganese Oxide, Mn_3O_4	0.03
Undetermined	xxxxxx

Done to 1-24-03

Silica Value=	43.64
Base: Acid Ratio=	0.85
T_{250} Temperature=	2281 °F
Type of Ash=	LIGNITIC
Fouling Index=	1.81

Respectfully submitted,
COMMERCIAL TESTING & ENGINEERING CO.
Connie Christianson
Gillette Laboratory

MEMBER ACIL

F-465
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January 10, 2003

RAG COAL WEST, INC.
EAGLE BUTTE MINE
P.O. BOX 3040
GILLETTE WY 82717

Sample identification by
RAG Coal West, Inc.

SAMPLE ID:	36-104330
TRAIN #:	BMBSB001
TOTAL TONNAGE:	14090.350
CUSTOMER:	OTTERTAIL POWER
PLANT:	BIG STONE
LOAD DATE:	01/04/2003

Kind of sample reported to us: COAL

Sample taken at: Belle Ayr

Sample taken by: RAG Coal West, Inc.

Date sampled: January 4, 2003

Date received: January 10, 2003

Analysis report no. 44-59397

ANALYSIS OF ASH	% Weight Ignited Basis
Silica, SiO_2	31.47
Alumina, Al_2O_3	16.10
Titania, TiO_2	1.39
Ferric Oxide, Fe_2O_3	5.09
Lime, CaO	27.44
Magnesia, MgO	4.94
Potassium Oxide, K_2O	0.20
Sodium Oxide, Na_2O	1.52
Sulfur Trioxide, SO_3	8.60
Phosphorous Pentoxide, P_2O_5	1.31
Strontium Oxide, SrO	0.57
Barium Oxide, BaO	0.72
Manganese Oxide, Mn_3O_4	0.03
Undetermined	0.62

Silica Value=	45.65
Base: Acid Ratio=	0.80
T_{250} Temperature=	2219 °F
Type of Ash=	LIGNITIC
Fouling Index=	1.52

Respectfully submitted,
COMMERCIAL TESTING & ENGINEERING CO.
Kathy Bayer
Gillette Laboratory

MEMBER ACIL

MINNESOTA VALLEY TESTING LABORATORIES, INC.
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MEMBER ACIL

Sample Number: 03-C99

Report Date: 1/21/03

Tom Hrdlicka
Ottertail Power - Big Stone
PO Box 218
Big Stone City SD 57216-0218

Work Order #: 89-51
P.O. #: 7830

Sample Description: Soybeans
Sample Site: OTP Big Stone

*** PROXIMATE ***

ANALYTE	AS RECEIVED		DRY BASIS	
Total Moisture	9.85	wt. %		
Ash	4.28	wt. %	4.75	wt. %
BTU/lb	9338	BTU/lb	10359	BTU/lb
Total Sulfur	0.31	wt. %	0.34	wt. %

*** ULTIMATE ***

ANALYTE	AS RECEIVED		DRY BASIS	
Total Moisture	9.85	wt. %		
Ash	4.28	wt. %	4.75	wt. %
Carbon	48.97	wt. %	54.32	wt. %
Hydrogen	7.50	wt. %	7.10	wt. %
Nitrogen	5.71	wt. %	6.33	wt. %
Total Sulfur	0.31	wt. %	0.34	wt. %
Oxygen by Difference	33.23	wt. %	27.16	wt. %

*** SULFUR FORMS ***

ANALYTE	AS RECEIVED		DRY BASIS	
Total Sulfur	0.31	wt. %	0.34	wt. %

*** ASH FUSION ***

ANALYTE	REDUCING	OXIDIZING

*** MINERAL ANALYSIS OF ASH ***

ANALYTE	DRY BASIS	
Potassium Oxide in Ash	43.39	wt. %
Sodium Oxide	1.30	wt. %

*** MISCELLANEOUS ***

ANALYTE	AS RECEIVED
Hydrogen less H2O	6.40
Oxygen Less H2O	24.48

Approved By: D. Lorden

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710 S. 14th St. - Grand Forks, ND 58201 - 800-272-7645 - Fax 701-772-0028
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MEMBER ACIL

Sample Number: 03-C98

Report Date: 1/21/03

Tom Hrdlicka
Ottertail Power - Big Stone
PO Box 218
Big Stone City SD 57216-0218

Work Order #: 89-51
P.O. #: 7830

Sample Description: Corn
Sample Site: OTP Big Stone

*** PROXIMATE ***

ANALYTE	AS RECEIVED	DRY BASIS
Total Moisture	14.51 wt. %	
Ash	1.03 wt. %	1.20 wt. %
BTU/lb	6925 BTU/lb	8100 BTU/lb
Total Sulfur	0.35 wt. %	0.41 wt. %

*** ULTIMATE ***

ANALYTE	AS RECEIVED	DRY BASIS
Total Moisture	14.51 wt. %	
Ash	1.03 wt. %	1.20 wt. %
Carbon	40.12 wt. %	46.93 wt. %
Hydrogen	6.79 wt. %	6.04 wt. %
Nitrogen	1.14 wt. %	1.33 wt. %
Total Sulfur	0.35 wt. %	0.41 wt. %
Oxygen by Difference	50.57 wt. %	44.08 wt. %

*** SULFUR FORMS ***

ANALYTE	AS RECEIVED	DRY BASIS
Total Sulfur	0.35 wt. %	0.41 wt. %

*** ASH FUSION ***

ANALYTE	REDUCING	OXIDIZING

*** MINERAL ANALYSIS OF ASH ***

ANALYTE	DRY BASIS
Potassium Oxide in Ash	29.39 wt. %
Sodium Oxide	0.50 wt. %

*** MISCELLANEOUS ***

ANALYTE	AS RECEIVED	DRY BASIS
Hydrogen less H2O	5.17	
Oxygen Less H2O	37.68	

Approved By: D. Jarden

Sample Site: OTP Big Stone
Sample Description: OTP Fly Ash Sample
Sample Date: 23 Mar 2004

Analyte	Results	Units
SO3 in Ash	4.25	wt. %
Calcium Oxide in Ash	30.61	wt. %
Magnesium Oxide in Ash	6.88	wt. %
Sodium Oxide in Ash	2.81	wt. %
Potassium Oxide in Ash	0.51	wt. %
Aluminum Oxide in Ash	16.80	wt. %
Barium Oxide in Ash	0.87	wt. %
Iron Oxide in Ash	6.61	wt. %
Manganese Dioxide in Ash	0.06	wt. %
Silicon Dioxide in Ash	25.57	wt. %
Strontium Oxide in Ash	0.58	wt. %
Titanium Dioxide in Ash	1.38	wt. %
Phosphorus Pentoxide	1.22	wt. %
Arsenic	43.00	ug/g
Selenium	32.70	ug/g

Note: Unless otherwise idicated, results are on an As Received Basis.

B17 Ultimate Coal Analysis

ULTIMATE ANALYSIS
AS RECEIVED

Sample Date	Moisture %	Ash %	Carbon %	Nitrogen %	Sulfur %	Hydrogen %	Oxygen %	HHV btu/lb	NaO %	Merc % ug/g Dry
06-Jan-02	29.59	5.16	49.23	0.70	0.39	3.95	10.98	8469	1.50	
13-Jan-02	29.10	5.03	49.68	0.70	0.36	3.54	11.59	8656	1.00	0.169
20-Jan-02	30.11	5.00	49.25	0.70	0.37	3.77	10.80	8492	1.40	
28-Jan-02	29.61	4.59	49.60	0.71	0.39	3.74	11.36	8568	1.80	
03-Feb-02	29.80	4.98	48.68	0.66	0.40	3.80	11.68	8570	1.80	
10-Feb-02	28.86	4.81	49.03	0.64	0.39	3.76	12.51	8656	1.40	0.096
17-Feb-02	29.44	4.57	49.11	0.65	0.35	3.57	12.31	8690	1.70	
24-Feb-02	30.24	4.94	48.63	0.71	0.36	3.70	11.42	8172	1.60	
03-Mar-02	30.08	5.00	48.83	0.65	0.35	3.76	11.33	8399	1.50	
10-Mar-02	29.56	4.66	49.69	0.65	0.32	3.75	11.37	8559	1.50	0.058
17-Mar-02	30.39	4.68	48.93	0.65	0.40	3.96	10.99	8440	1.50	
24-Mar-02	30.22	5.00	48.86	0.65	0.44	5.09	9.74	8357	1.60	
31-Mar-02	29.69	5.49	48.97	0.66	0.37	3.64	11.18	8410	1.20	
07-Apr-02	29.39	4.61	49.58	0.64	0.35	3.52	11.91	8660	1.70	
14-Apr-02	29.44	4.72	48.80	0.74	0.42	3.16	12.72	8528	1.50	0.113
21-Apr-02	29.80	4.20	49.70	0.64	0.35	3.47	11.84	8582	1.40	
28-Apr-02	27.53	4.58	50.37	0.69	0.32	3.77	12.74	8653	1.40	
05-May-02	29.69	4.45	48.92	0.65	0.30	3.63	12.36	8550	1.40	
12-May-02	Outage	Outage	Outage	Outage	Outage	Outage	Outage	Outage	Outage	
19-May-02	29.07	4.85	49.39	0.65	0.38	3.60	12.06	8627	1.60	0.087
26-May-02	29.88	4.27	49.32	0.67	0.30	3.69	11.87	8483	1.90	
02-Jun-02	28.53	4.80	48.88	0.76	0.27	3.97	12.79	8557	1.60	
09-Jun-02	30.24	4.69	48.26	0.63	0.37	3.56	12.25	8381	1.30	0.07
16-Jun-02	NA	NA	NA	NA	NA	NA	NA	NA	NA	
23-Jun-02	26.23	5.18	51.01	0.67	0.36	3.81	12.74	8818	1.00	
30-Jun-02	29.28	4.67	48.65	0.70	0.32	3.74	12.64	8500	1.50	
07-Jul-02	29.29	4.89	49.15	0.72	0.24	3.74	11.97	8509	1.00	
14-Jul-02	29.60	4.79	48.44	0.69	0.28	3.95	12.25	8528	1.40	0.073
21-Jul-02	28.39	4.43	49.24	0.64	0.31	4.12	12.87	8636	1.20	
28-Jul-02	28.32	4.17	49.80	0.66	0.25	4.08	12.72	8629	1.50	
04-Aug-02	29.35	4.23	49.41	0.64	0.30	3.96	12.11	8644	1.40	
11-Aug-02	29.57	4.92	48.53	0.65	0.27	3.36	12.70	8487	1.00	0.078
18-Aug-02	30.00	4.67	48.33	0.67	0.37	3.66	12.30	8440	1.30	
25-Aug-02	30.01	5.08	47.26	0.66	0.39	3.53	13.07	8291	1.50	
01-Sep-02	29.07	4.17	49.39	0.63	0.31	3.65	12.78	8692	1.90	
08-Sep-02	29.16	4.62	48.90	0.69	0.34	3.58	12.71	8579	2.00	0.099
15-Sep-02	Outage	Outage	Outage	Outage	Outage	Outage	Outage	Outage	Outage	
22-Sep-02	Outage	Outage	Outage	Outage	Outage	Outage	Outage	Outage	Outage	
29-Sep-02	Outage	Outage	Outage	Outage	Outage	Outage	Outage	Outage	Outage	
06-Oct-02	Outage	Outage	Outage	Outage	Outage	Outage	Outage	Outage	Outage	
13-Oct-02	Outage	Outage	Outage	Outage	Outage	Outage	Outage	Outage	Outage	
20-Oct-02	Outage	Outage	Outage	Outage	Outage	Outage	Outage	Outage	Outage	
27-Oct-02	Outage	Outage	Outage	Outage	Outage	Outage	Outage	Outage	Outage	
03-Nov-02	Outage	Outage	Outage	Outage	Outage	Outage	Outage	Outage	Outage	
10-Nov-02	Outage	Outage	Outage	Outage	Outage	Outage	Outage	Outage	Outage	
17-Nov-02	29.90	4.16	49.30	0.65	0.30	3.41	12.28	8568	1.50	
24-Nov-02	30.15	5.06	48.38	0.66	0.28	3.22	12.25	8375	1.20	0.074
08-Dec-02	28.99	4.40	49.89	0.62	0.24	3.67	12.19	8649	1.30	
15-Dec-02	29.35	4.32	49.52	0.66	0.27	3.57	12.31	8699	1.40	0.249
22-Dec-02	29.21	4.23	49.77	0.63	0.26	3.44	12.46	8653	1.60	
29-Dec-02	29.61	5.21	48.48	0.63	0.40	3.50	12.17	8410	1.40	
Average	29.39	4.71	49.13	0.67	0.34	3.71	12.06	8539.15	1.46	0.11

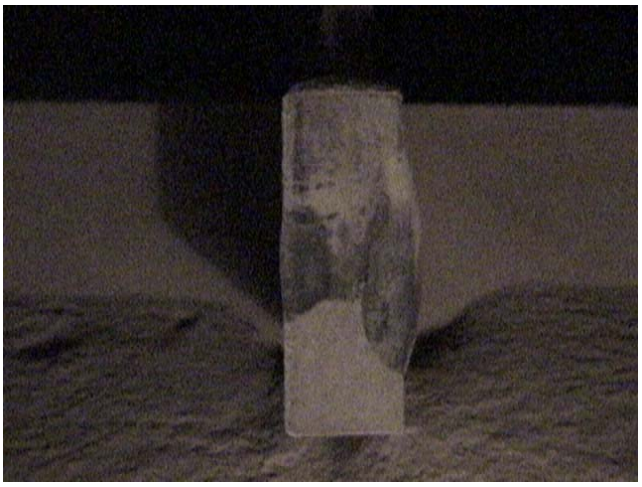
ULTIMATE ANALYSIS
AS RECEIVED

Sample Date	Moisture %	Ash %	Carbon %	Nitrogen %	Sulfur %	Hydrogen %	Oxygen %	HHV btu/lb	NaO %	Merc % ug/g Dry
05-Jan-03	30.31	4.60	48.51	0.65	0.50	3.43	12.00	8415	1.90	
06-Jan-03	29.75	4.79	48.86	0.64	0.39	3.43	12.14	8465	1.30	
07-Jan-03	29.82	4.74	48.39	0.67	0.39	3.03	12.96	8431	1.70	
08-Jan-03	28.79	4.86	49.34	0.68	0.40	3.05	12.88	8593	1.60	
12-Jan-03	28.85	4.19	50.03	0.69	0.24	3.04	12.96	8692	1.30	0.093
19-Jan-03	28.91	4.75	49.71	0.66	0.29	3.59	12.09	8696	1.40	
26-Jan-03	29.09	4.23	49.73	0.85	0.24	3.55	12.31	8624	1.30	
02-Feb-03	21.42	4.44	54.26	1.05	0.28	4.19	14.36	9477	2.00	
09-Feb-03	30.26	4.23	49.20	0.69	0.25	3.48	11.89	8487	1.40	0.103
16-Feb-03	27.91	4.37	50.12	1.08	0.28	3.79	12.45	8672	1.30	
23-Feb-03	26.60	5.10	48.81	1.36	0.31	4.14	13.68	8618	0.31	
02-Mar-03	NA	NA	NA	NA	NA	NA	NA	NA	NA	
09-Mar-03	29.99	4.48	49.46	0.63	0.26	4.21	10.97	8534	1.40	
16-Mar-03	29.23	4.53	49.32	0.66	0.26	3.74	12.26	8516	1.30	0.116
23-Mar-03	29.96	4.10	49.40	0.67	0.21	3.23	12.43	8581	1.10	
30-Mar-03	29.39	6.23	48.42	0.66	0.27	3.27	11.76	8402	1.80	
06-Apr-03	29.34	4.72	49.26	0.67	0.24	3.35	12.42	8514	1.20	
13-Apr-03	30.14	4.96	48.57	0.69	0.39	3.62	11.63	8474	1.60	0.116
20-Apr-03	30.16	4.87	48.65	0.68	0.49	3.70	11.45	8390	1.70	
27-Apr-03	30.74	4.33	48.77	0.67	0.35	3.54	11.60	8377	1.40	
04-May-03	30.57	4.81	48.95	0.66	0.30	3.59	11.12	8332	1.70	
11-May-03	29.97	4.56	50.35	0.68	0.35	3.73	10.36	8476	1.40	0.113
18-May-03	29.18	4.87	50.09	0.67	0.29	3.61	11.29	8572	1.10	
25-May-03	29.17	4.81	50.22	0.66	0.31	3.75	11.08	8557	1.40	
01-Jun-03	29.26	4.72	49.69	0.72	0.44	3.58	11.59	8501	1.80	
08-Jun-03	NA	NA	NA	NA	NA	NA	NA	NA	NA	
15-Jun-03	29.96	4.43	49.24	0.70	0.45	3.63	11.59	8476	1.70	0.013
22-Jun-03	29.52	4.42	49.74	0.65	0.32	3.42	11.93	8564	1.40	
29-Jun-03	30.43	4.74	48.83	0.71	0.36	3.40	11.53	8404	1.70	
06-Jul-03	29.10	4.56	50.03	0.67	0.30	3.42	11.92	8539	1.00	
13-Jul-03	30.39	4.90	48.72	0.67	0.42	3.10	11.80	8415	1.30	0.105
20-Jul-03	29.36	4.28	50.07	0.69	0.31	3.51	11.78	8663	1.20	
27-Jul-03	28.14	5.06	49.96	0.68	0.60	3.70	11.86	8633	0.90	
03-Aug-03	29.70	4.61	49.24	0.70	0.40	3.83	11.52	8474	1.40	
10-Aug-03	28.75	4.28	50.44	0.74	0.29	4.06	11.44	8663	1.10	0.081
17-Aug-03	29.04	5.44	49.38	0.76	0.33	3.88	11.17	8415	1.30	
24-Aug-03	28.98	4.84	49.89	0.65	0.29	3.54	11.81	8584	1.20	
31-Aug-03	28.92	4.85	49.86	0.69	0.27	3.51	11.90	8500	0.80	
07-Sep-03	29.69	4.23	50.77	0.70	0.27	3.69	10.65	8656	1.40	
14-Sep-03	29.35	4.52	49.83	0.68	0.32	3.28	12.02	8489	1.40	0.084
21-Sep-03	30.82	4.88	48.81	0.72	0.26	3.56	11.35	8275	1.10	
28-Sep-03	29.26	4.74	50.11	0.75	0.35	3.65	11.14	8590	1.10	
05-Oct-03	29.17	4.26	50.42	0.68	0.23	3.35	11.89	8561	1.60	
12-Oct-03	NA	NA	NA	NA	NA	NA	NA	NA	NA	
19-Oct-03	NA	NA	NA	NA	NA	NA	NA	NA	NA	
26-Oct-03	27.13	5.07	51.78	0.67	0.28	3.30	11.77	8847	1.10	0.069
02-Nov-03	28.99	4.46	50.15	0.71	0.35	3.58	11.76	8636	1.10	
09-Nov-03	29.51	4.26	49.18	0.69	0.28	3.51	12.57	8545	1.20	0.071
16-Nov-03	29.93	4.86	47.98	0.71	0.43	3.64	12.45	8431	1.30	
23-Nov-03	30.26	4.75	47.73	0.66	0.44	3.42	12.74	8489	1.40	
30-Nov-03	30.33	4.35	48.75	0.71	0.36	3.36	12.14	8444	1.40	
07-Dec-03	NA	NA	NA	NA	NA	NA	NA	NA	NA	
14-Dec-03	NA	NA	NA	NA	NA	NA	NA	NA	NA	
21-Dec-03	NA	NA	NA	NA	NA	NA	NA	NA	NA	
28-Dec-03	29.76	5.08	49.07	0.70	0.42	3.47	11.50	8557	1.30	0.057

ULTIMATE ANALYSIS
AS RECEIVED

Sample Date	Moisture %	Ash %	Carbon %	Nitrogen %	Sulfur %	Hydrogen %	Oxygen %	HHV btu/lb	NaO %	Mercury ug/g Dry
04-Jan-04	29.76	5.09	48.59	0.70	0.44	3.44	11.98	8471	1.60	
11-Jan-04	29.33	4.62	49.57	0.69	0.33	3.38	12.08	8624	1.10	0.093
18-Jan-04	28.30	4.40	51.62	0.75	0.33	3.57	11.03	8602	1.70	
25-Jan-04	30.05	4.26	51.23	0.73	0.28	3.38	10.07	8548	1.70	
01-Feb-04	29.85	5.27	48.97	0.69	0.46	3.44	11.32	8503	1.80	
08-Feb-04	29.27	4.31	49.78	0.70	0.27	3.48	12.19	8604	1.40	0.035
15-Feb-04	30.58	4.38	49.39	0.68	0.26	3.34	11.37	8390	1.00	
22-Feb-04	29.67	4.99	49.05	0.70	0.44	3.59	11.56	8460	1.40	
29-Feb-04	28.68	4.83	50.30	0.73	0.43	3.36	11.67	8658	1.90	
07-Mar-04	29.65	4.70	50.04	0.69	0.34	3.43	11.15	8545	1.20	
14-Mar-04	28.54	4.87	50.47	0.72	0.40	3.49	11.51	8631	1.80	0.105
21-Mar-04	29.43	4.50	49.42	0.68	0.28	3.58	12.11	8543	1.70	
28-Mar-04	31.09	4.44	50.01	0.67	0.30	3.46	10.03	8428	1.50	
04-Apr-04	28.26	4.34	50.27	0.69	0.35	3.60	12.49	8712	1.80	
11-Apr-04	28.43	4.94	49.69	0.71	0.30	3.80	12.13	8622	1.50	0.089
18-Apr-04	28.75	4.22	50.96	0.67	0.26	3.36	11.78	8653	1.30	
25-Apr-04	29.68	4.72	49.54	0.68	0.38	3.36	11.64	8501	1.60	
02-May-04	28.11	4.51	51.45	0.66	0.41	3.47	11.39	8698	1.40	
09-May-04	29.19	4.46	50.73	0.62	0.30	3.50	11.20	8626	1.90	0.086
16-May-04	29.02	4.84	50.73	0.60	0.25	3.49	11.07	8581	1.30	
23-May-04	29.30	4.54	50.00	0.70	0.43	3.49	11.54	8528	1.60	
30-May-04	29.50	5.07	49.61	0.72	0.42	3.68	11.00	8449	1.40	
06-Jun-04	NA	NA	NA	NA	NA	NA	NA	NA	NA	
13-Jun-04	29.93	5.07	49.93	0.76	0.43	3.65	10.23	8352	1.40	
20-Jun-04	28.75	5.06	51.16	0.78	0.38	3.74	10.13	8516	1.70	0.154
27-Jun-04	29.40	4.71	49.98	0.68	0.40	3.68	11.15	8449	1.70	
04-Jul-04	29.10	4.89	50.11	0.68	0.35	3.63	11.24	8519	1.60	
11-Jul-04	29.54	4.67	50.45	0.67	0.33	3.55	10.79	8503	1.30	0.111
18-Jul-04	29.47	4.87	50.59	0.70	0.38	3.55	10.44	8509	1.50	
25-Jul-04	30.43	5.26	49.63	0.73	0.33	3.65	9.97	8305	1.60	
01-Aug-04	30.66	4.60	49.96	0.67	0.37	3.68	10.06	8323	1.60	
08-Aug-04	29.01	5.68	50.50	0.69	0.33	3.69	10.10	8433	1.30	0.144
15-Aug-04	21.55	5.64	55.18	0.80	0.43	3.95	12.45	9223	1.50	
22-Aug-04	29.78	4.68	50.19	0.67	0.39	3.63	10.66	8437	1.70	
29-Aug-04	28.86	5.30	50.85	0.64	0.30	3.57	10.48	8518	1.10	
05-Sep-04	29.27	4.74	51.01	0.71	0.40	3.70	10.17	8606	1.60	
12-Sep-04	29.14	4.96	50.83	0.68	0.41	3.65	10.33	8500	2.10	0.08
19-Sep-04	14.38	5.96	60.86	0.86	0.43	4.32	13.19	10028	1.50	
26-Sep-04	29.37	4.35	51.85	0.67	0.25	3.69	9.82	8546	1.20	
03-Oct-04	29.32	4.63	50.39	0.81	0.37	3.61	10.87	8478	1.00	
10-Oct-04	29.79	4.61	50.68	0.71	0.39	3.71	10.11	8435	2.30	0.1
17-Oct-04	29.50	5.11	49.88	0.69	0.41	3.53	10.88	8410	1.50	
24-Oct-04	NA	NA	NA	NA	NA	NA	NA	NA	NA	
31-Oct-04	NA	NA	NA	NA	NA	NA	NA	NA	NA	
07-Nov-04	NA	NA	NA	NA	NA	NA	NA	NA	NA	
14-Nov-04	30.14	4.72	50.46	0.67	0.34	3.54	10.13	8424	1.30	
21-Nov-04	29.84	5.14	49.95	0.66	0.41	3.48	10.52	8446	1.40	0.123
28-Nov-04	25.84	5.02	53.08	0.57	0.46	3.69	11.34	8782	1.40	
05-Dec-04	29.49	5.07	50.85	0.73	0.28	3.47	10.11	8530	0.90	
12-Dec-04	29.62	4.18	51.10	0.69	0.22	3.53	10.66	8575	1.20	0.082
19-Dec-04	30.61	5.00	48.84	0.69	0.38	3.41	11.07	8284	1.20	
26-Dec-04	28.62	4.92	50.40	0.74	0.39	3.56	11.37	8611.00	1.40	

B18 Photographs from January 19, 2003 inspection



Anvil – Front View

Anvil – Angle View

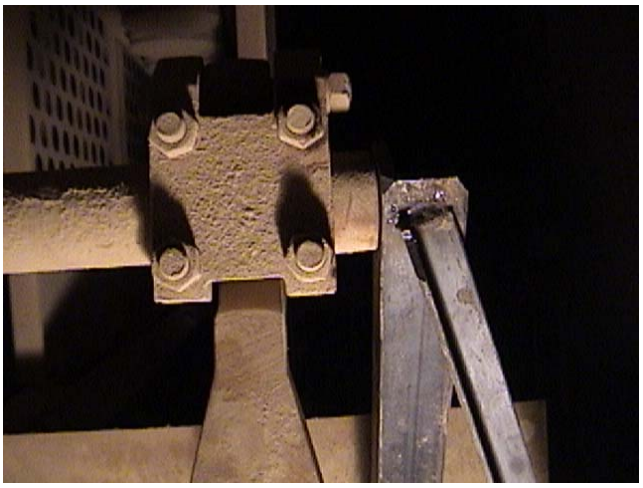
Missing Roller

Damaged Bolt & Nut

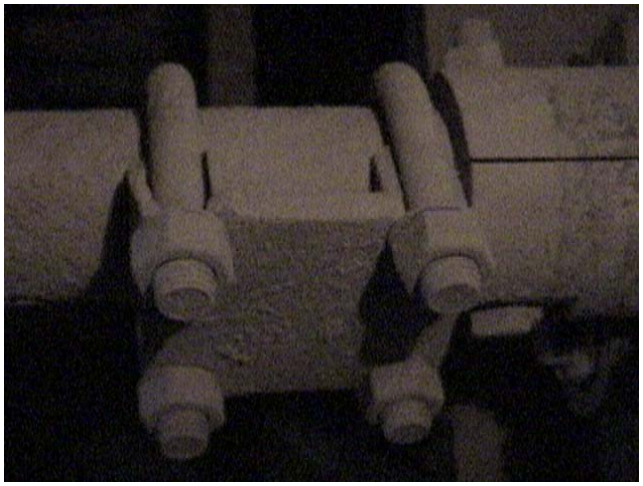
Rapper Shaft Coupler

Bent Support

New Thrust Support – End View



New Thrust Support – Side View

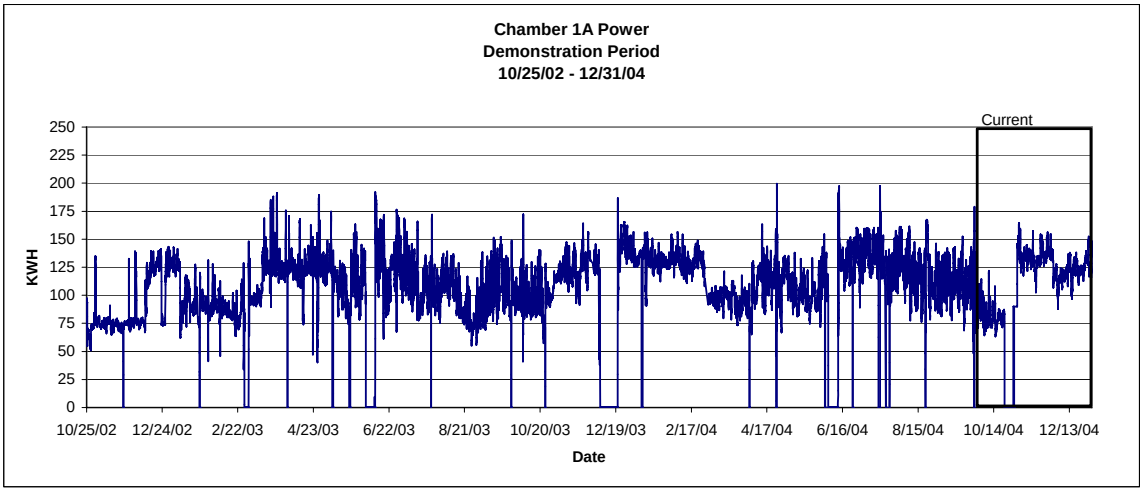


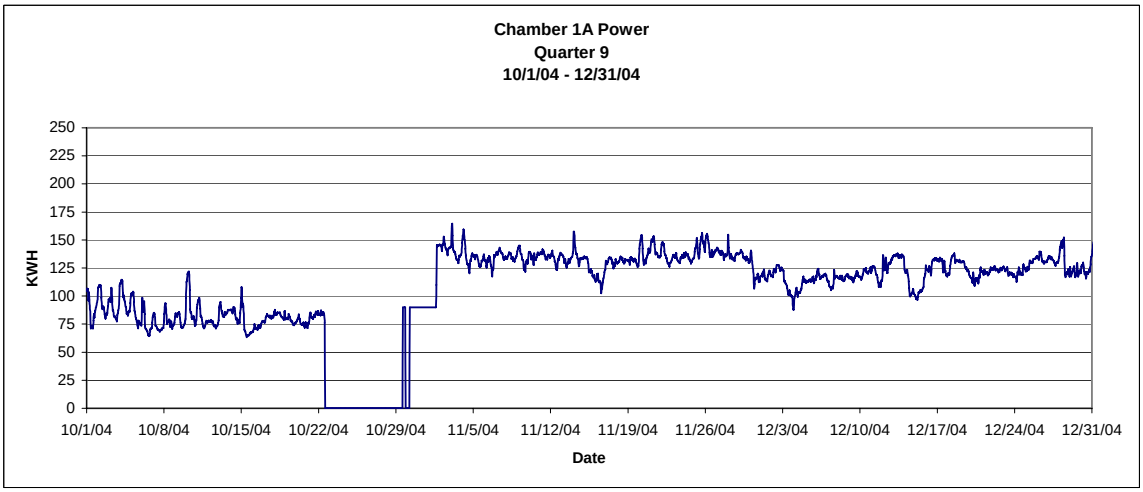
Missing Hammer

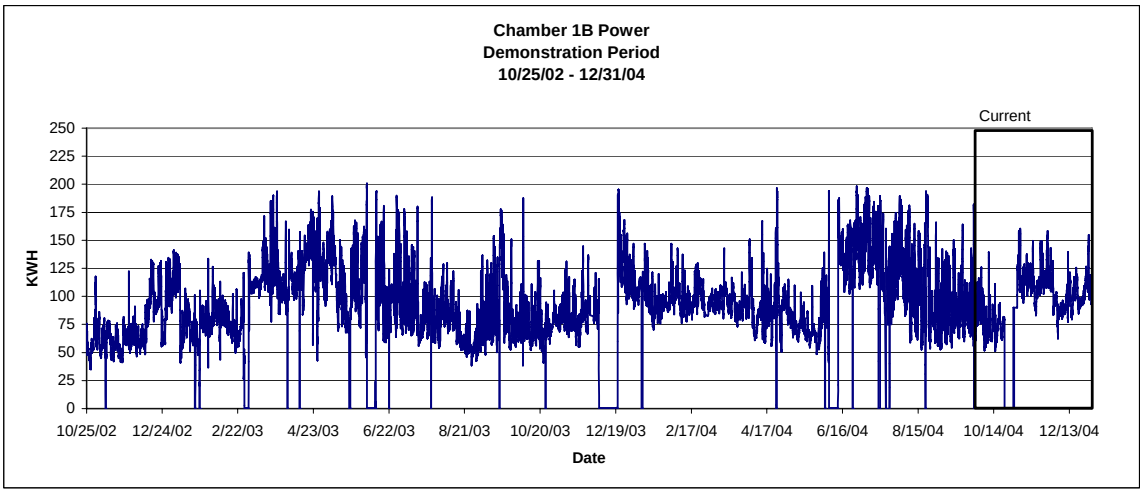
Broken Hammer Mount

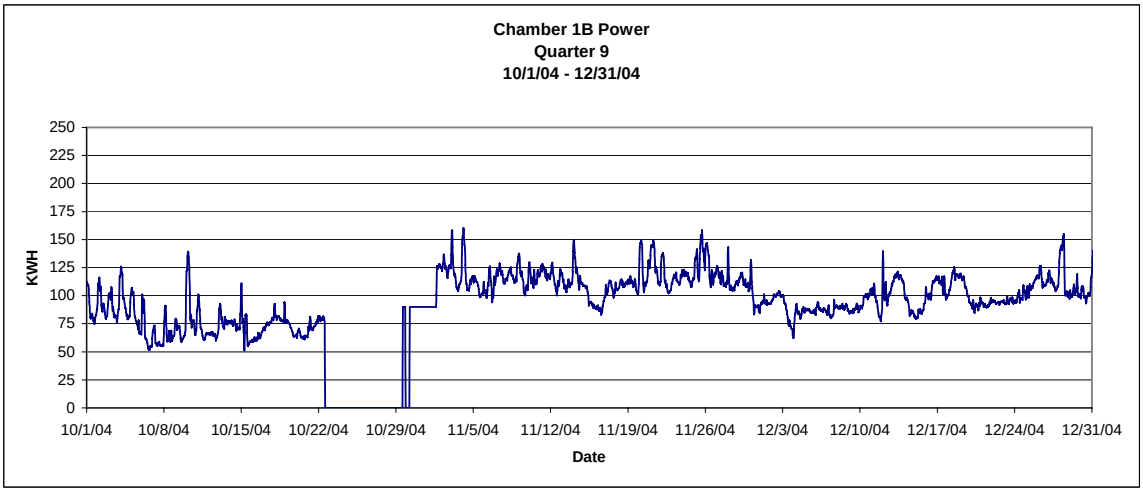
Broken Mount – Close Up View

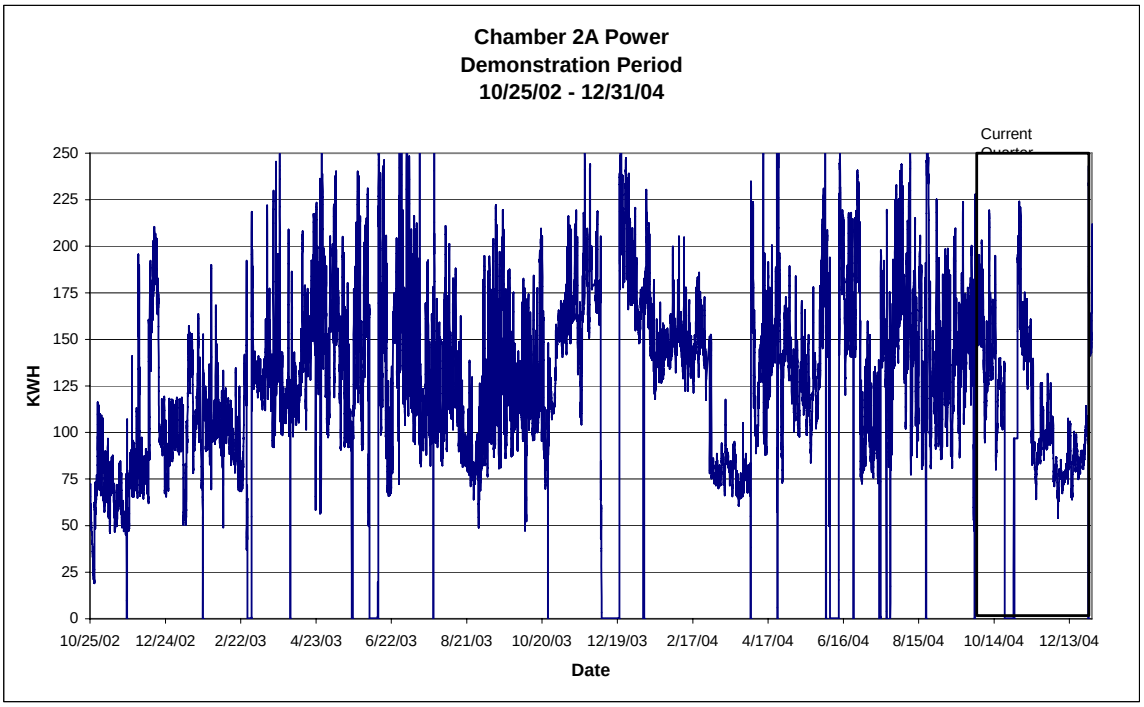
B19 ESP Power by Chamber






Chamber 1B Power
Demonstration Period
10/25/02 - 12/31/04
Current
KWH
250
225
200
175
150
125
100
75
50
25
0
10/25/02
12/24/02
2/22/03
4/23/03
6/22/03
8/21/03
10/20/03
12/19/03
2/17/04
4/17/04
6/16/04
8/15/04
10/14/04
12/13/04
Date


Chamber 1B Power
Quarter 9
10/1/04 - 12/31/04
KWH
250
225
200
175
150
125
100
75
50
25
0
10/1/04
10/8/04
10/15/04
10/22/04
10/29/04
11/5/04
11/12/04
11/19/04
11/26/04
12/3/04
12/10/04
12/17/04
12/24/04
12/31/04
Date


Chamber 2A Power
Demonstration Period
10/25/02 - 12/31/04
Current
KWH
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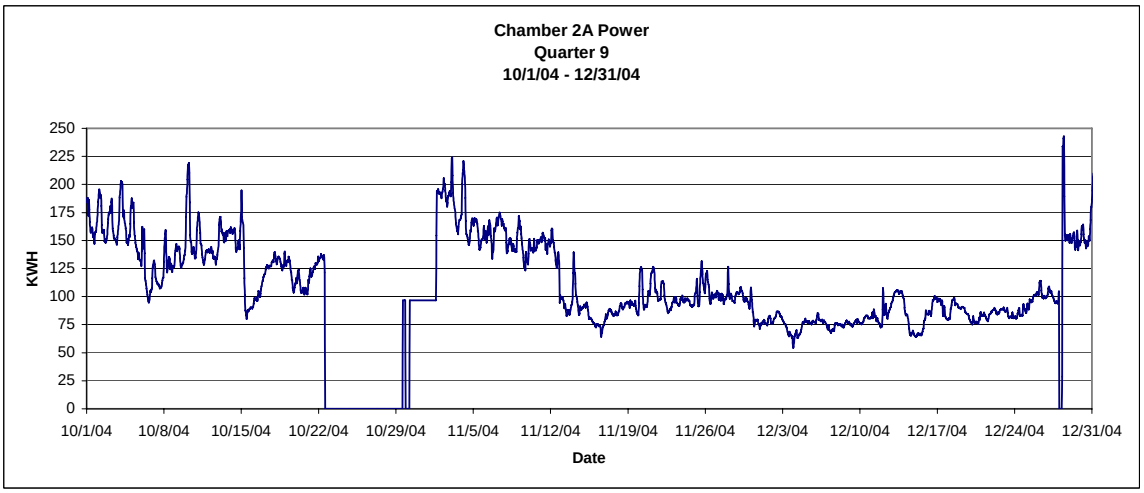
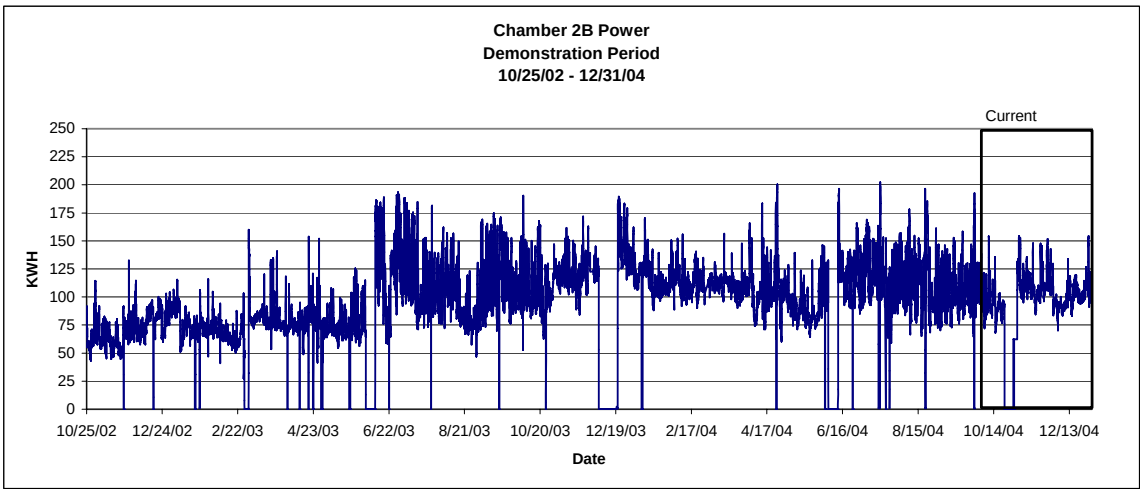
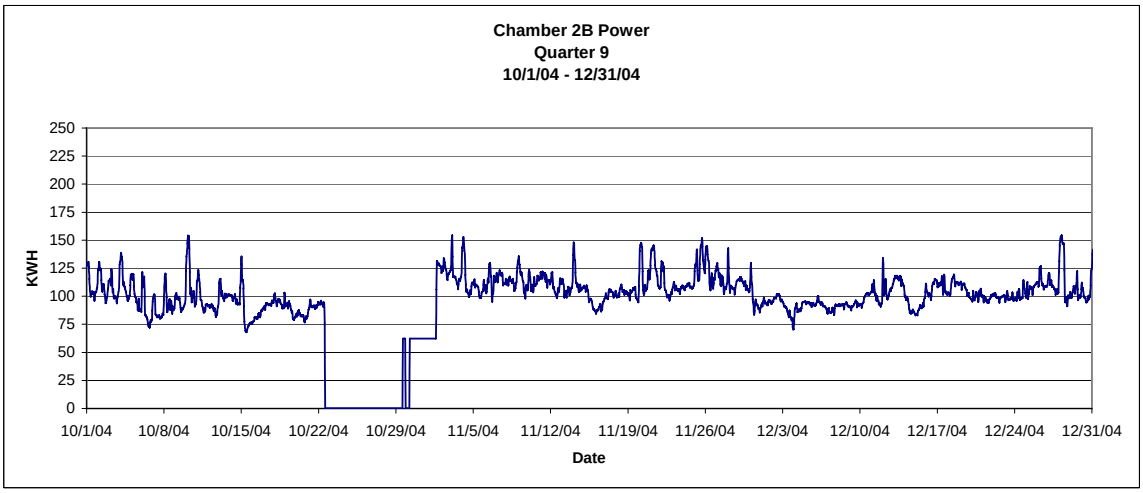
225
200
175
150
125
100
75
50
25
0
10/25/02
12/24/02
2/22/03
4/23/03
6/22/03
8/21/03
10/20/03
12/19/03
2/17/04
4/17/04
6/16/04
8/15/04
10/14/04
12/13/04
Date


Chamber 2A Power
Quarter 9
10/1/04 - 12/31/04
KWH
250
225
200
175
150
125
100
75
50
25
0
10/1/04
10/8/04
10/15/04
10/22/04
10/29/04
11/5/04
11/12/04
11/19/04
11/26/04
12/3/04
12/10/04
12/17/04
12/24/04
12/31/04
Date


Chamber 2B Power
Demonstration Period
10/25/02 - 12/31/04
Current
KWH
250
225
200
175
150
125
100
75
50
25
0
10/25/02
12/24/02
2/22/03
4/23/03
6/22/03
8/21/03
10/20/03
12/19/03
2/17/04
4/17/04
6/16/04
8/15/04
10/14/04
12/13/04
Date


Chamber 2B Power
Quarter 9
10/1/04 - 12/31/04
KWH
250
225
200
175
150
125
100
75
50
25
0
10/1/04
10/8/04
10/15/04
10/22/04
10/29/04
11/5/04
11/12/04
11/19/04
11/26/04
12/3/04
12/10/04
12/17/04
12/24/04
12/31/04
Date

B20 ESP Tabular Data

Transformer/Rectifier Performance Readings

28-Oct-02	Limits: mA = 700, kV = 45, spm = 12											
Chamber	Field 1			Field 2			Field 3			Field 4		
	mA	kV	spm	mA	kV	spm	mA	kV	spm	mA	kV	spm
1A	--	--	--	320	45.6	11	705	48.4	2	705	50.3	0
1B	--	--	--	254	46.9	11	711	45	11	711	45.6	2
2A	--	--	--	432	53.6	13	320	48.4	12	569	47.6	12
2B	--	--	--	361	47.2	12	645	42.2	11	592	44.8	10

29-Oct-02	Limits: mA = 700, kV = 45, spm = 12											
Chamber	Field 1			Field 2			Field 3			Field 4		
	mA	kV	spm	mA	kV	spm	mA	kV	spm	mA	kV	spm
1A	--	--	--	296	45.4	12	705	47.2	0	705	50.5	0
1B	--	--	--	284	48.7	13	569	45.6	12	684	47	13
2A	--	--	--	409	54	11	284	50.2	12	699	50.7	11
2B	--	--	--	391	49.2	11	664	43.8	12	711	46.2	10

30-Oct-02	Limits: mA = 700, kV = 45, spm = 12											
Chamber	Field 1			Field 2			Field 3			Field 4		
	mA	kV	spm	mA	kV	spm	mA	kV	spm	mA	kV	spm
1A	--	--	--	320	40.4	12	711	47.9	1	705	50.8	0
1B	--	--	--	260	49.2	11	652	47.3	11	703	47.3	10
2A	--	--	--	503	53.8	12	343	50.8	12	705	52	3
2B	--	--	--	260	48	14	592	45.7	11	675	48.6	12

22-Nov-02	Limits: mA = 700, kV = 65, spm = 50 for F2 and 12 for F3 and F4											
Chamber	Field 1			Field 2			Field 3			Field 4		
	mA	kV	spm	mA	kV	spm	mA	kV	spm	mA	kV	spm
1A	--	--	--	332	46.7	49	664	48.1	11	705	54.1	3
1B	--	--	--	278	51.3	50	557	49.1	12	213	43.2	11
2A	--	--	--	361	51.8	50	284	44.7	12	592	50.9	12
2B	--	--	--	367	50.9	49	391	49.5	12	616	46.6	12

1B CHAMBER

Date	Time	Inlet Temp	1ST FIELD			2ND FIELD			3RD FIELD			4TH FIELD			ave mA for
er		(F)	mA	kV	spm	mA	kV	spm	mA	kV	spm	mA	kV	spm	AH Chambe
11/22/2002	9:00 AM		off			190	51	12	480	49.4	12	379	47.7	12	349.7
	11:10 AM					278	51.3	50	557	49.1	12	213	43.2	11	349.3
11/23/2002	18:00 pm					346	53.5	50	705	52.1	2	705	53.3	0	585.3
1/6/2003			575			570			705			701			658.7
began burning soybeans at 600 to 700 tons/day															
1/9/2003		309.0	94	57.3		379	50.4		468	48.4		420	48.5		422.3
1/10/2003		303.0	112	62.4		400	53.4		509	52		569	53.6		492.7
stopped burning soybeans															
1/13/2003		297.0	302	58.4		581	50.8		717	50.2		711	51.4		669.7
1/13/2003			456	67.1	99	616	51.7	50	723	49.6	6	705	51.4	1	681.3
1/14/2003	07:30am	300.0	124	58.1	99	332	53.7	50	509	50.9	12	557	52.8	11	466.0
1/15/2003	07:30am	305.0	130	60.7	100	373	53.4	50	498	50.6	12	681	53.3	11	517.3
inspected and repaired compartments 4 and 11 collecting plate rapper shafts 1/19/2003															
Burning soybeans at lower rate 60-200 tons/day															
1/20/2003	07:30am	298.0	71	60.9	92	379	52.5	49	397	48.9	12	622	52.6	11	466.0
1/22/2003	plant tripped @ 14:40 CT back on line at midnight														
1/23/2003		296.0	94	57	99	343	48.7	52	486	47.6	12	640	50.2	8	489.7
1/26/2003		296.0	94	55.5	100	462	47.5	49	492	48.7	12	604	48.4	11	519.3
1/28/2003	7:30 AM	300.0	231	59.4	62.5	521	49.5	49	640	49.7	11	723	51.9	12	628.0
	15:30 pm	304.0	189	50.8	100	468	50.3	53	616	50.3	11	723	50.2	10	602.3
1/28/2003	spark limit setpoint increased in2nd and 3rd fields to 99 spm														
1/29/2003	7:30 AM	303.0	130	58.1	99	498	49.8	101	735	50.1	95	622	48.2	4	618.3
1/30/2003	7:30 AM	312.0	106	52	101	337	41.1	102	575	46.9	101	652	49.2	9	521.3
2/3/2003	7:30 AM	300.0	343	60.5	99	521	43.6	98	711	49.8	1	705	51.3	1	645.7
2/4/2003	7:30 AM	290.0	189	58.9	99	403	48.4	100	687	49.3	100	735	51.6	5	608.3
2/5/2003	7:30 AM	302.0	177	54.7	99	468	46.4	101	634	49.3	100	711	53	83	604.3
2/6/2003	11:30 AM														
2/6/2003	15:20 pm	299.0	170	61	100	500	51	100	690	51	99	705	55	38	631.7
	17:00 pm	301.0	130	58	100	480	50	100	690	50	99	705	53	66	625.0
2/7/2003	8:15 AM	299.0	142	56	100	569	49	100	634	50	100	705	54	25	636.0
	12:05 PM														
	16:00 pm	313.0	83	56	100	355	43	100	569	45	101	598	48	54	507.3
2/8/2003	3:00	288.0	177	58	99	480	49	102	687	49	78	705	51	0	624.0
	4:42	256.0	527		3	705		0	707		0	707		0	706.3
	12:00	301.0	142	60	100	426	51	101	640	49	100	705	53	0	590.3
	19:00	308.0	284	61	98	474	50	100	711	50	13	705	52	0	630.0
2/9/2003	10:00	299.0	237	63	100	652	52	98	711	52	11	711	50	0	691.3
tempoarily raised TR current limit setpoints when compartments were not at 100 spm - max was 1000 mA															
	13:00	313.0	130	54	100	430	49	100	570	49	100	806	51	100	602.0
	14:45	315.0	124	56	99	450	49	99	628	49	100	705	51	2	594.3
	17:00	308.0	106	60	99	533	50	99	509	44	100	705	52	0	582.3
2/10/2003	10:00	292.0	142	55	101	492	47	99	616	49	97	705	54	53	604.3
	19:10	300.0	201	63	89	438	50	101	699	50	86	711	53	1	616.0
2/11/2003	8:45	308.0	184	61	100	379	49	101	604	48	100	705	51	225	562.7
2/12/2003	7:30	293.0	118	58.2	100	361	44.8	101	675	49.7	100	705	51.5	0	580.3
2/12/2003	10:40	296.0	166	57	100	438	52	101	646	51	100	687	53	96	590.3
Each field was individually power off rapped starting with #2,#3,#4, and then 1st field															
Increased soybean burn rate to 500 ton/day on 13th															
	17:00	308.0	332	64	99	474	46	99	705	49	0	705	49	0	628.0
2/13/2003	7:30	302.0	142	53.7	100	397	48.7	100	616	49.8	100	634	49.5	100	549.0
2/16/2003	7:30	296.0	189	60.2	99	450	46.7	100	521	49.1	101	515	44.6	50	495.3
2/19/2003	7:30		118	55.7	99	320	46.9	99	616	49.7	99	640	49.5	99	525.3
2/21/2003	7:30		154	60.8	99	343	50.8	99	563	50.7	99	675	53.5	100	527.0
2/24/2003	7:30		189	63.5	100	361	53.1	100	592	52.7	101	711	54.7	8	554.7
Plant down for boiler wash, replaced first section of collecting plate rapper shafts and outboard bearing. Rapped all plates off															
3/3/2003	9:00		901	63	101	705	49	0	711	43.7	0	705	43	0	707.0
	14:31		824	65	6	705	49	0	705	44	0	705	43	0	705.0
	18:35		723	62	99	705	50	0	705	46	0	705	45	0	705.0
	20:12		474	63	93	705	52	1	705	47	0	705	47	0	705.0
	23:42		346	61	78	705	52	0	705	48	0	711	48	0	707.0
3/4/2003	7:20		296	64	7	681	51	1	705	50	0	705	49	0	697.0

2A CHAMBER

Date	1ST FIEL			Inlet Temp	2ND FIELD			3RD FIELD			4TH FIELD			ave mA AH
er	mA	kV	spm	(F)	mA	kV	spm	mA	kV	spm	mA	kV	spm	chamber
11/22/2002	off				296	53.8	12	249	57.8	12	521	52	12	355.3
11/22/2002					361	51.8	50	284	44.7	12	592	50.9	12	412.3
11/23/2002					438	56.8	50	515	52.5	11	705	52.7	1	552.7
1/6/2003	23				672			546			705			641.0
1/9/2003	0	0		268	349	58.4		260	51.3		575	56.1		394.7
1/10/2003	124	65		263	569	56.5		379	53		705	55.2		551.0
1/13/2003	492	65		255	699	54.5		652	54.1		705	48.9		685.3
1/13/2003	527	52.6	3		711	54.5	42	664	54.8	12	705	48.4	1	693.3
1/14/2003	94	65.1	0	255	557	57.7	49	343	52.3	11	586	52.7	11	495.3
1/15/2003	136	65	2	260	557	55.2	51	415	52	11	687	52.7	2	553.0
1/19/2003														
1/20/2003	201	65.2	0	249	586	52	46	415	51.2	12	705	51.5	0	568.7
1/23/2003	249	65	1	253	699	57.7	34	403	50.5	13	705	51.3	0	602.3
1/26/2003	195	65.1	0	251	640	55.7	45	403	50.9	11	705	52	8	582.7
1/28/2003	201	65	0	264	723	58.1	27	403	51.3	12	705	52.5	0	610.3
1/28/2003	136	65.1	0	259	664	53.9	51	415	52.8	12	705	53.5	0	594.7
1/29/2003	183	65.1	4	255	705	59.2	11	438	59.2	100	705	52.3	0	616.0
1/30/2003	189	65	4	267	711	58.6	45	373	50.8	100	705	52	0	596.3
2/3/2003	367	65	3	255	723	54.5	8	563	52.7	100	705	49.8	0	663.7
2/4/2003	171	65	1	262	705	58.8	8	432	52.8	100	705	52.5	0	614.0
2/5/2003	94	65.2	2	265	581	54.8	102	343	50	101	675	51.7	52	533.0
2/6/2003	130	65	5	265	711	58	94	379	52	98	705	55	1	598.3
2/6/2003	140	65	0	264	699	59	99	380	52	100	711	55	0	596.7
2/7/2003	83	65	0	261	634	58	100	355	52	51	705	55	32	564.7
2/7/2003	142	65	1	275	610	54	100	332	48	100	711	52	4	551.0
2/8/2003	213	65	3	259	705	58	22	616	56	101	705	51	0	675.3
2/8/2003	496		0	238	705		0	705		0	706		0	705.3
2/8/2003	106	65	3	269	563	56	99	379	51	100	711	53	8	551.0
2/8/2003	177	65	1	264	705	58	11	426	51	100	705	52	0	612.0
2/9/2003	166	65	0	260	705	58	12	474	51	99	705	50	0	628.0
2/9/2003	189	65	0	278	680	55	87	379	49	100	800	53	1	619.7
2/9/2003	166	65	0	278	687	54	82	367	49	100	705	52	0	586.3
2/9/2003	124	65	6	273	640	56	100	349	50	100	711	52	1	566.7
2/10/2003	106	65	0	254	664	56	100	415	51	100	705	53	0	594.7
2/10/2003	130	65	0	257	705	60	40	391	49	101	705	52	0	600.3
2/11/2003	177	65	0	265	711	57	67	415	50	100	705	52	0	610.3
2/12/2003	166	65	15	252	634	55.9	98	373	49.4	99	711	52.4	69	572.7
2/12/2003	94	65	0	262	664	55	92	420	53	100	705	54	0	596.3
2/12/2003	177	65	28	267	705	57	1	533	52	100	705	49	0	647.7
2/13/2003	85	65.1	0	270	634	58.4	99	379	47.9	100	705	53.8	28	572.7
2/16/2003	189	65	0	251	652	56.5	29	462	53.2	100	711	52.2	0	608.3
2/19/2003	112	65	0		509	47.3	100	320	50.4	101	675	52.5	79	501.3
2/21/2003	94	65.1	3		432	50.3	97	290	52.5	100	669	47.7	98	463.7
2/24/2003	130	65.1	0		699	59.7	98	373	62	99	711	55.6	0	594.3
-line, pulsed bags at low load														
3/3/2003	1114	63	##		705	50	0	705	53	0	711	43	0	707.0
	966	65	0		711	51	0	705	53	0	711	43	0	709.0
	758	65	1		705	51	0	705	54	0	705	44	0	705.0
	604	65	1		705	52	3	705	55	9	711	46	0	707.0
	509	65	3		705	54	0	687	53	89	705	47	0	699.0
3/4/2003	367	65	0		705	56	7	509	50	98	705	48	0	639.7

2B CHAMBER

Date	Time	Inlet Temp (F)	1ST FIELD mA	1ST FIELD kV	1ST FIELD spm	2ND FIELD mA	2ND FIELD kV	2ND FIELD spm	3RD FIELD mA	3RD FIELD kV	3RD FIELD spm	4TH FIELD mA	4TH FIELD kV	4TH FIELD spm	ave mA AH chamber
11/22/2002	9:00 AM		off			320	48.9	12	545	48.6	12	509	46.4	12	458
	11:10 AM					367	50.9	49	391	49.5	12	616	46.6	12	458
11/23/2002	18:00 pm					320	53.3	50	705	51.2	1	705	51.9	5	577
1/6/2003			85			491			708			705			635
began burning soybeans at 600 to 700 tons/day															
1/9/2003		303.0	35	47.1		296	52.7		533	50.5		521	51.6		450
1/10/2003		303.0	94	49		374	56.5		509	53.9		503	51.6		462
stopped burning soybeans															
1/13/2003		292.0	94	50		409	50.2		598	51.6		711	51.3		573
1/13/2003			94	52.6	99	486	51.3	51	610	52.9	12	634	50.5	12	577
1/14/2003	07:30am	295.0	106	48.6	101	320	50.4	48	462	53	11	486	50.4	11	423
1/15/2003	07:30am	298.0	88	49.3	99	420	55.3	51	557	53.9	12	581	48.3	12	519
inspected and repaired compartments 4 and 11 collecting plate rapper shafts 1/19/2003															
Burning soybeans at lower rate 60-200 tons/day															
1/20/2003	07:30am	285.0	59	46.9	99	355	52.7	50	616	49.7	12	669	52.7	12	547
1/22/2003	plant tripped	@ 14:40 CT back on line at midnight													
1/23/2003		287.0	59	48.8	97	379	52	51	669	51.3	12	675	51.5	8	574
1/26/2003		296.0	71	49.1	98	385	50.1	49	592	48.2	12	521	49.8	10	499
1/28/2003	7:30 AM	303.0	53	49.1	98	401	53.2	50	581	52	10	634	52.8	10	539
	15:30 pm	291.0	83	49.9	100	415	54	51	616	50.9	12	575	52.7	10	535
1/28/2003	spark limit setpoint increased in2nd and 3rd fields to 99 spm														
1/29/2003	7:30 AM	288.0	94	49	99	450	53	99	640	53.4	96	705	53.7	36	598
1/30/2003	7:30 AM	302.0	118	51.9	99	308	50.6	101	705	50.8	99	711	52	36	575
2/3/2003	7:30 AM	293.0	112	46.7	100	450	48.6	100	604	50.6	100	729	50.6	20	594
2/4/2003	7:30 AM	301.0	71	49.7	101	438	50.9	101	723	51.3	95	551	43.9	95	571
2/5/2003	7:30 AM	303.0	77	46.9	100	373	46.2	101	628	49.9	100	664	49.6	97	555
2/6/2003	11:30 AM														
2/6/2003	15:20 pm	300.0	70	50	99	280	50	101	695	49	100	604	51	65	526
	17:00 pm	302.0	40	54	100	390	52	100	581	51	100	580	53	92	517
2/7/2003	8:15 AM	299.0	106	48	99	391	54	99	640	51	100	735	52	61	589
	12:05 PM														
	16:00 pm	307.0	94	47	99	415	48	101	581	48	99	705	49	36	567
2/8/2003	3:00	293.0	77	51	98	486	54	96	699	51	88	711	51	1	632
	4:42	265.0	92		98	663		78	707		0	706		0	692
	12:00	307.0	94	50	101	379	52	99	652	50	101	711	51	4	581
	19:00	302.0	59	49	98	450	52	99	646	49	97	705	52	15	600
2/9/2003	10:00	296.0	65	49	98	426	77	100	515	50	100	705	50	21	549
tempoarily raised TR current limit setpoints when compartments were not at 100 spm - max was 1000 mA															
	13:00	315.0	94	50	100	272	52	99	580	51`	100	664	50	66	505
	14:45	315.0	59	49	100	373	53	100	498	48	100	640	48	86	504
	17:00	311.0	94	47	99	355	46	99	450	46	100	634	46	97	480
2/10/2003	10:00	294.0	96	51	100	379	54	98	577	51	100	604	43	100	520
	19:10	293.0	59	53	100	385	54	100	509	49	100	557	48	101	484
2/11/2003	8:45	301.0	59	54	99	355	52	99	557	51	100	551	47	93	488
2/12/2003	7:30	288.0	71	47.1	99	403	51.9	99	498	44.5	99	675	50.5	99	525
2/12/2003	10:40	299.0	71	50	99	385	52	101	486	51	100	569	49	98	480
Each field was individually power off rapped starting with #2,#3,#4, and then 1st field															#DIV/0!
Increased soybean burn rate to 500 ton/day on 13th															
	17:00	302.0	71	48	100	476	52	100	545	51	100	705	50	1	575
2/13/2003	7:30	308.0	94	43.3	99	391	53.8	100	563	52	100	652	50	99	535
2/16/2003	7:30	286.0	71	52.3	99	397	52.2	101	456	51	99	693	51.4	98	515
2/19/2003	7:30		130	54.2	99	367	49.8	99	391	50.1	101	521	50.4	99	426
2/21/2003	7:30		53	49.1	99	243	48.1	101	438	46.3	100	616	50.5	100	432
2/24/2003	7:30		59	53.4	100	355	54.1	99	450	53.8	101	581	50.4	39	462
Plant down for boiler wash, replaced first section of collecting plate rapper shafts and outboard bearing. Rapped all plates off-line, pulse															
3/3/2003	9:00		326	50	98	711	53	0	705	45	0	705	44	0	707
	14:31		166	57	99	705	54	5	705	46	0	711	45	0	707
	18:35		71	53	98	533	49	100	705	48	0	705	48	0	648
	20:12		71	50	101	480	51	101	711	49	1	705	49	2	632
	23:42		118	49	98	462	50	99	699	47	93	711	50	1	624
3/4/2003	7:20		47	57	100	468	48	99	717	50	84	711	51	0	632

Transformer/Rectifier Performance Readings

16-Apr-03 * Limiting factors highlighted

Chamber	Field 1			Field 2			Field 3			Field 4		
	mA	kV	spm	mA	kV	spm	mA	kV	spm	mA	kV	spm
1A	192	58.8	98	535	44	19	997	50.1	3	1001	52.4	0
1B	464	61.4	97	661	48.9	19	818	48.5	19	1000	51.6	1
2A	600	64.8	6	774	50.3	19	494	46.8	19	995	50.3	3
2B	84	48	99	433	49.3	19	619	46.4	19	591	40.6	18

18-May-03 * Limiting factors highlighted

Chamber	Field 1			Field 2			Field 3			Field 4		
	mA	kV	spm	mA	kV	spm	mA	kV	spm	mA	kV	spm
1A	138	61.5	91	425	44.3	19	919	49	18	970	54.1	15
1B	328	58.1	99	480	47.6	19	717	47.9	19	811	49.1	19
2A	596	62.8	86	584	49.1	19	587	49.7	19	814	48.5	19
2B	96	49.7	98	372	49	19	602	46	19	681	48.3	19

17-Jun-03 * Limiting factors highlighted

Chamber	Field 1			Field 2			Field 3			Field 4		
	mA	kV	spm	mA	kV	spm	mA	kV	spm	mA	kV	spm
1A	128	64.4	33	664	47.3	19	979	49.3	11	997	54.7	3
1B	283	59.7	99	530	48.5	19	788	48.4	19	788	48.4	19
2A	497	63.4	46	770	52	19	645	50.4	19	953	50.1	10
2B	479	60.7	98	620	48.7	19	949	48.7	14	552	36.3	18

Transformer/Rectifier Performance Readings

15-Jul-03	* Limiting factors highlighted											
Chamber	Field 1			Field 2			Field 3			Field 4		
	mA	kV	spm	mA	kV	spm	mA	kV	spm	mA	kV	spm
1A	68	63.7	47	370	45.2	19	751	47.7	19	770	52.6	19
1B	172	55.5	99	319	47	19	537	46.1	19	601	48.2	19
2A	260	57.8	99	492	49	19	498	49.1	19	653	48.5	19
2B	262	57.3	99	434	48.5	19	720	47.2	19	620	47.5	19

15-Aug-03	* Limiting factors highlighted											
Chamber	Field 1			Field 2			Field 3			Field 4		
	mA	kV	spm	mA	kV	spm	mA	kV	spm	mA	kV	spm
1A	116	62.3	87	413	44.9	19	758	47.2	19	806	52.1	19
1B	194	56.3	99	346	47.1	19	566	46.1	19	597	47.9	19
2A	324	59.3	99	541	49.6	19	546	49.5	19	665	48.2	19
2B	337	59	99	490	49.3	19	765	48	19	660	47.8	19

15-Sep-03	* Limiting factors highlighted											
Chamber	Field 1			Field 2			Field 3			Field 4		
	mA	kV	spm	mA	kV	spm	mA	kV	spm	mA	kV	spm
1A	95	64.4	33	456	46	19	848	49.1	19	882	54.1	19
1B	195	57.1	99	359	47.6	19	567	46.5	19	632	48.9	19
2A	336	60.4	98	552	51.5	19	541	50.6	19	706	49.8	19
2B	317	59.4	99	473	49.7	19	738	48.5	19	681	47.9	19

Transformer/Rectifier Performance Readings

15-Oct-03 * Limiting factors highlighted

Chamber	Field 1			Field 2			Field 3			Field 4		
	mA	kV	spm	mA	kV	spm	mA	kV	spm	mA	kV	spm
1A	80	62.8	81	408	46.1	19	771	48.9	19	832	53.8	19
1B	123	55.9	99	330	48.6	19	534	47.5	19	598	48.6	19
2A	345	63.9	43	607	53.5	19	593	52.3	19	787	51	19
2B	273	60.5	98	457	50.2	19	743	49.5	19	688	48.7	19

15-Nov-03 * Limiting factors highlighted

Chamber	Field 1			Field 2			Field 3			Field 4		
	mA	kV	spm	mA	kV	spm	mA	kV	spm	mA	kV	spm
1A	113	64.6	24	538	46.1	19	927	49	16	970	52.7	8
1B	223	58.5	99	387	48.4	19	576	47.4	19	702	49.2	19
2A	485	64.1	42	753	49.1	19	750	49.7	18	962	48.8	9
2B	379	63.7	55	566	49.7	19	882	49.8	18	764	48.4	19

4-Dec-03 * Limiting factors highlighted

Chamber	Field 1			Field 2			Field 3			Field 4		
	mA	kV	spm	mA	kV	spm	mA	kV	spm	mA	kV	spm
1A	133	64.4	33	566	48	19	942	50.7	15	971	54.8	8
1B	215	60.2	99	435	50.5	19	627	49.2	18	718	50.7	19
2A	427	65	3	791	54	19	786	54.5	19	977	52	8
2B	301	64.2	29	567	51	18	903	51.6	18	688	44.7	18

Transformer/Rectifier Performance Readings

26-Feb-04	* Limiting factors highlighted											
Chamber	Field 1			Field 2			Field 3			Field 4		
	mA	kV	spm	mA	kV	spm	mA	kV	spm	mA	kV	spm
1A	81	64.8	10	609	49.9	19	947	51.4	9	977	56.6	8
1B	219	60	98	443	50.2	19	731	50.6	19	780	53.1	19
2A	250	63.4	52	682	56.2	19	708	57.1	19	939	53.6	17
2B	281	62.3	77	505	51	19	839	50.9	19	767	49.9	19

15-Mar-03	* Limiting factors highlighted											
Chamber	Field 1			Field 2			Field 3			Field 4		
	mA	kV	spm	mA	kV	spm	mA	kV	spm	mA	kV	spm
1A	Off	Off	Off	408	49.3	19	886	52.5	19	990	59.6	5
1B	229	61.6	97	549	52	19	807	52	19	892	54.4	19
2A	811	53	19	393	53.3	19	450	53.5	19	944	56.6	16
2B	263	64.7	12	615	52.5	19	918	52.7	18	689	41.5	18

Transformer/Rectifier Performance Readings

15-Apr-04	* Limiting factors highlighted											
Chamber	Field 1			Field 2			Field 3			Field 4		
	mA	kV	spm	mA	kV	spm	mA	kV	spm	mA	kV	spm
1A	94	64.9	4	610	49.2	19	975	52.1	8	981	56.3	7
1B	230	59.6	99	455	50.7	19	723	50.3	19	816	52.9	19
2A	421	63.6	55	704	55.5	19	682	55.4	19	905	51.6	18
2B	313	62.8	68	509	51.3	19	835	51.1	19	778	49.9	19

15-May-04	* Limiting factors highlighted											
Chamber	Field 1			Field 2			Field 3			Field 4		
	mA	kV	spm	mA	kV	spm	mA	kV	spm	mA	kV	spm
1A	425	64.4	30	481	47.3	19	870	49.7	19	881	54.4	19
1B	135	58.2	99	367	48.6	19	596	48.5	19	678	50.3	19
2A	445	64.4	38	646	53.3	19	592	52.7	19	814	50.1	19
2B	237	61.7	91	433	50.4	19	433	50.4	19	688	49.1	19

15-Jun-04	* Limiting factors highlighted											
Chamber	Field 1			Field 2			Field 3			Field 4		
	mA	kV	spm	mA	kV	spm	mA	kV	spm	mA	kV	spm
1A	64	64.8	12	533	47.9	19	887	49.6	18	972	55.1	11
1B	291	60.1	99	563	49.1	19	823	48.9	19	862	51.5	19
2A	334	64.7	17	706	53.8	19	671	53.8	19	913	50.3	18
2B	194	63.3	62	496	50.8	19	705	48.7	19	626	44.2	19

Transformer/Rectifier Performance Readings

* Limiting factors in bold box, changes from previous quarter highlighted in red

17-Jul-04

Chamber	Field 1			Field 2			Field 3			Field 4		
	mA	kV	spm	mA	kV	spm	mA	kV	spm	mA	kV	spm
1A	98	64.8	16	572	47.8	19	967	50.2	13	1000	56.2	1
1B	299	57.6	99	536	48.3	19	806	47.8	19	801	49.1	19
2A	288	62.2	20	742	54.1	19	749	54.1	19	951	51.1	12
2B	308	61.4	93	594	50.5	19	790	47.8	19	666	43	18

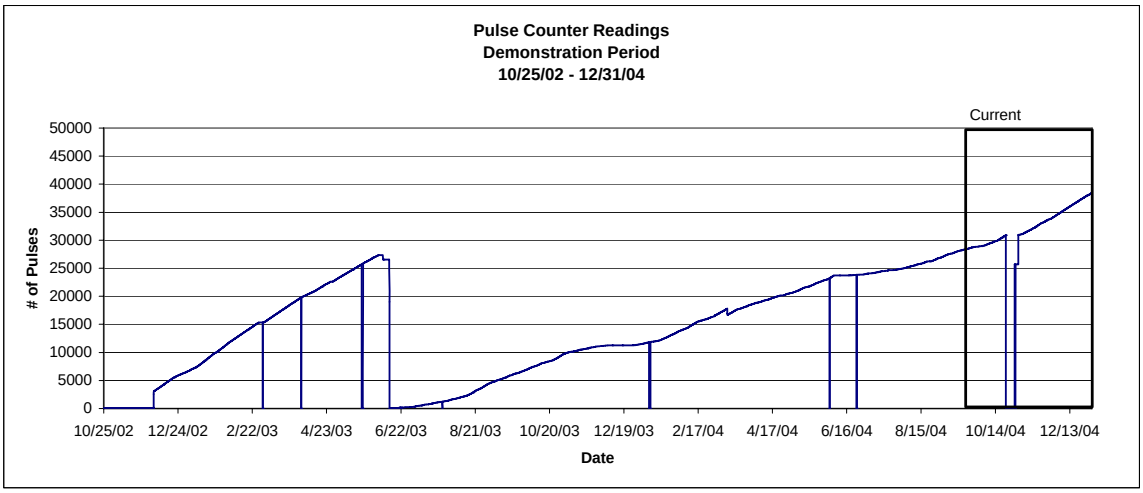
13-Aug-04

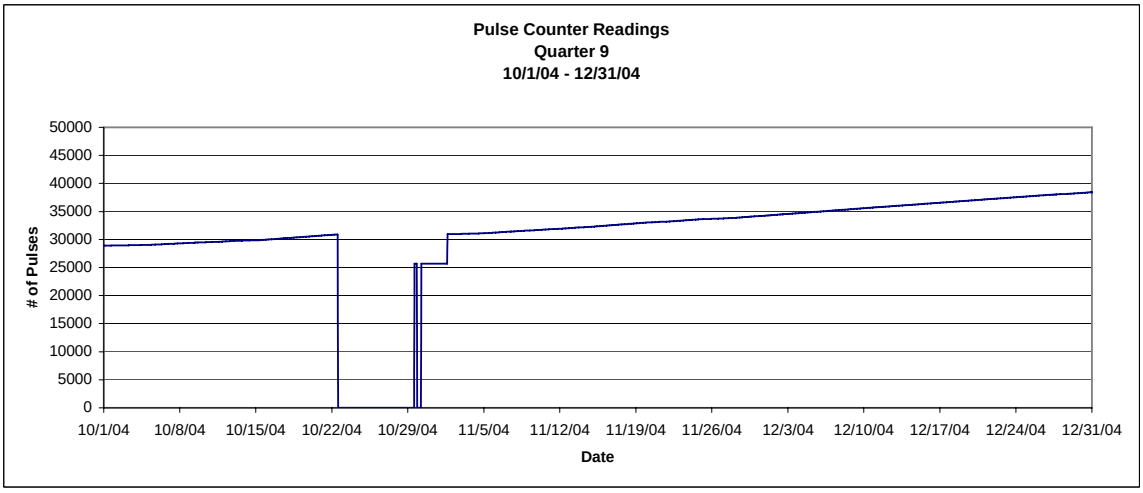
Chamber	Field 1			Field 2			Field 3			Field 4		
	mA	kV	spm	mA	kV	spm	mA	kV	spm	mA	kV	spm
1A	91	61.7	82	369	44.6	19	738	46.3	19	841	49.1	19
1B	226	55.6	99	374	44.8	19	581	44.6	19	525	44	19
2A	235	58.6	99	517	45.9	19	499	47.6	19	621	46.1	19
2B	156	58.6	99	468	44.5	19	701	45.3	19	633	44.9	19

20-Sep-04

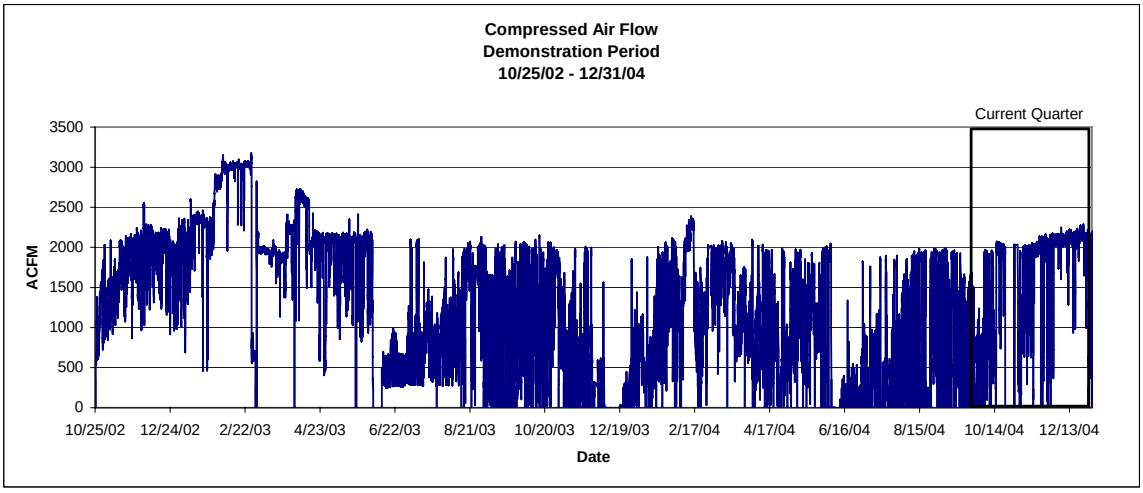
Chamber	Field 1			Field 2			Field 3			Field 4		
	mA	kV	spm	mA	kV	spm	mA	kV	spm	mA	kV	spm
1A	88	59.5	99	115	32.5	19	795	48.7	19	903	54.1	19
1B	173	56.4	99	357	47.8	19	632	45.9	19	475	45.7	18
2A	308	60.9	98	591	52	19	643	52.6	19	824	50	19
2B	201	59.6	99	467	50.2	19	684	48.6	19	662	47.7	19

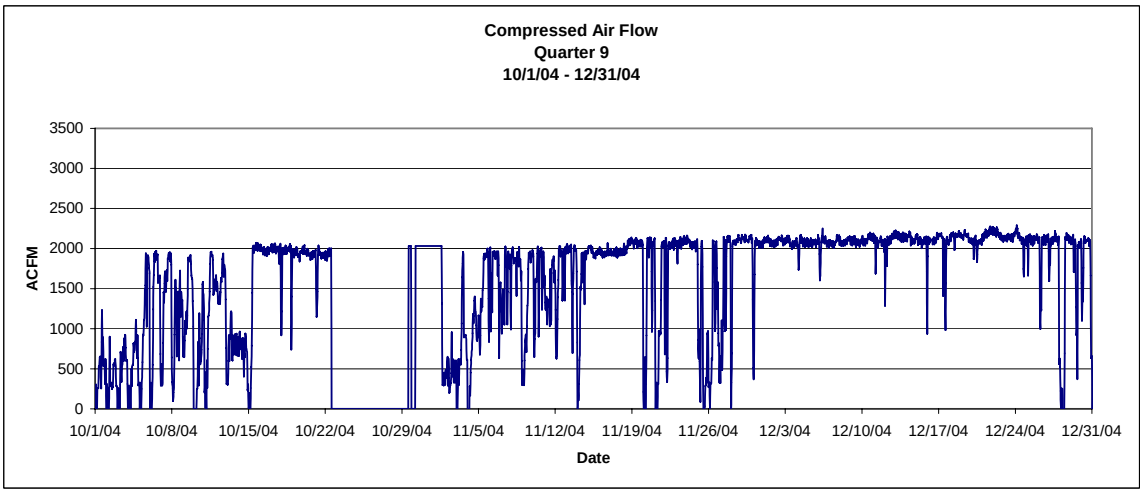
B21 Pulse Counter Readings





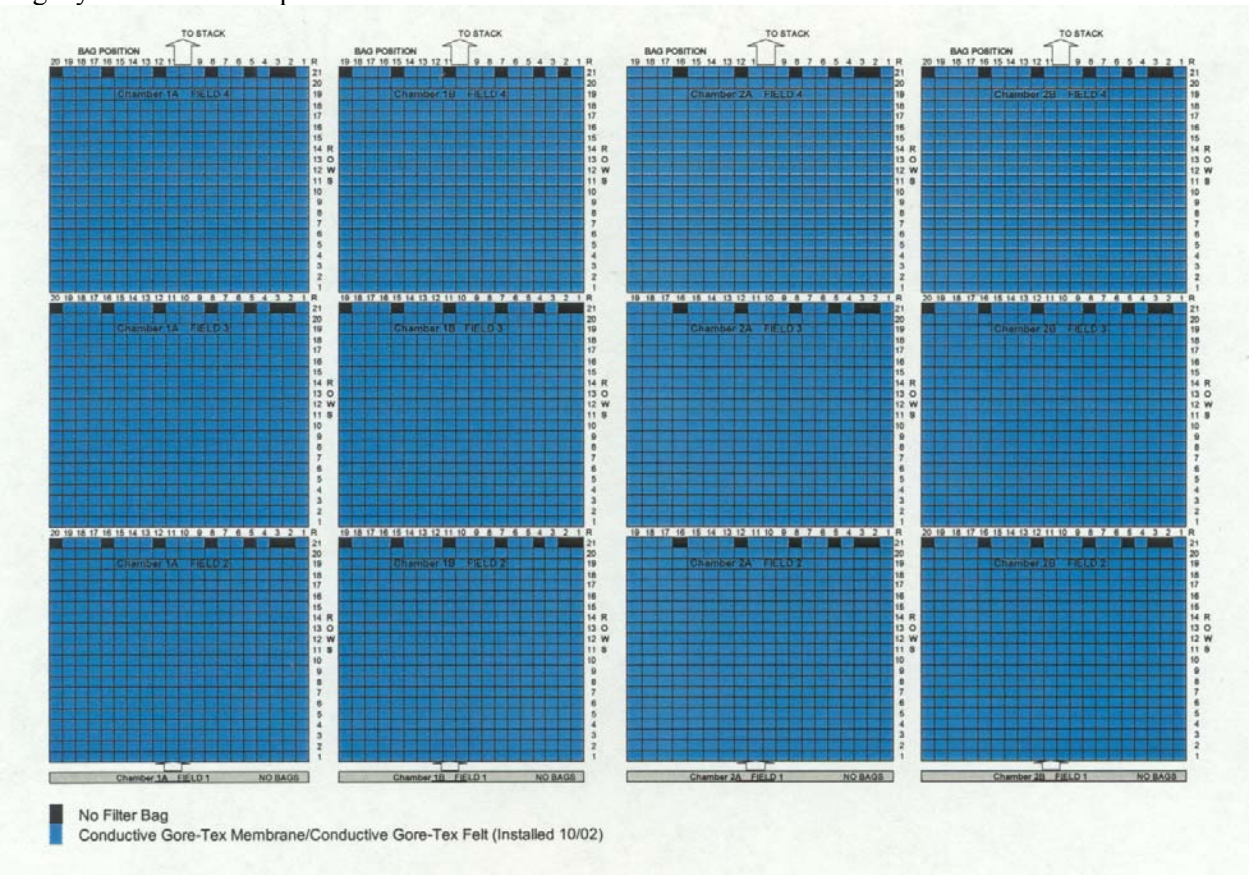
B22 Compressed Air Flow



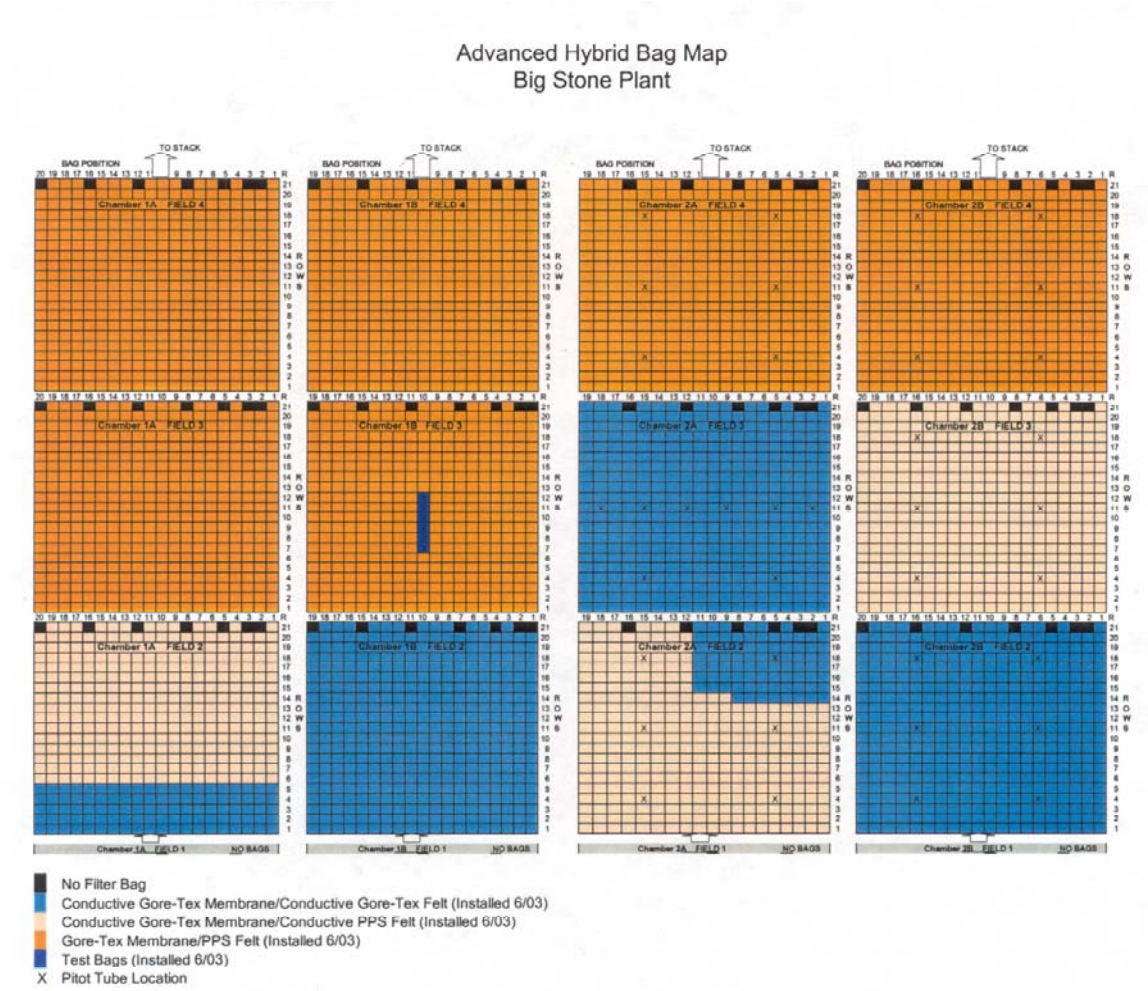


B23 Bag Layout Diagrams

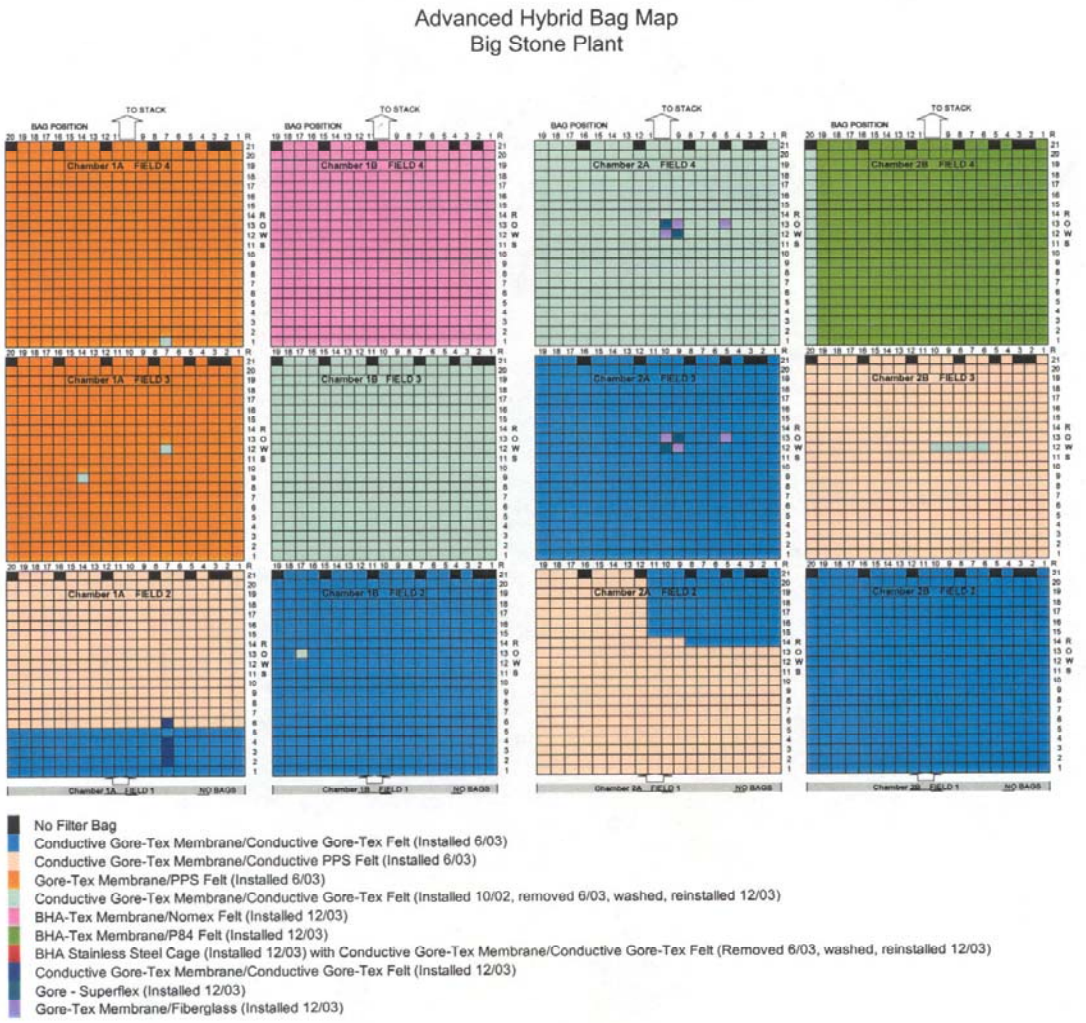
Bag layout from Start-up until June 2003



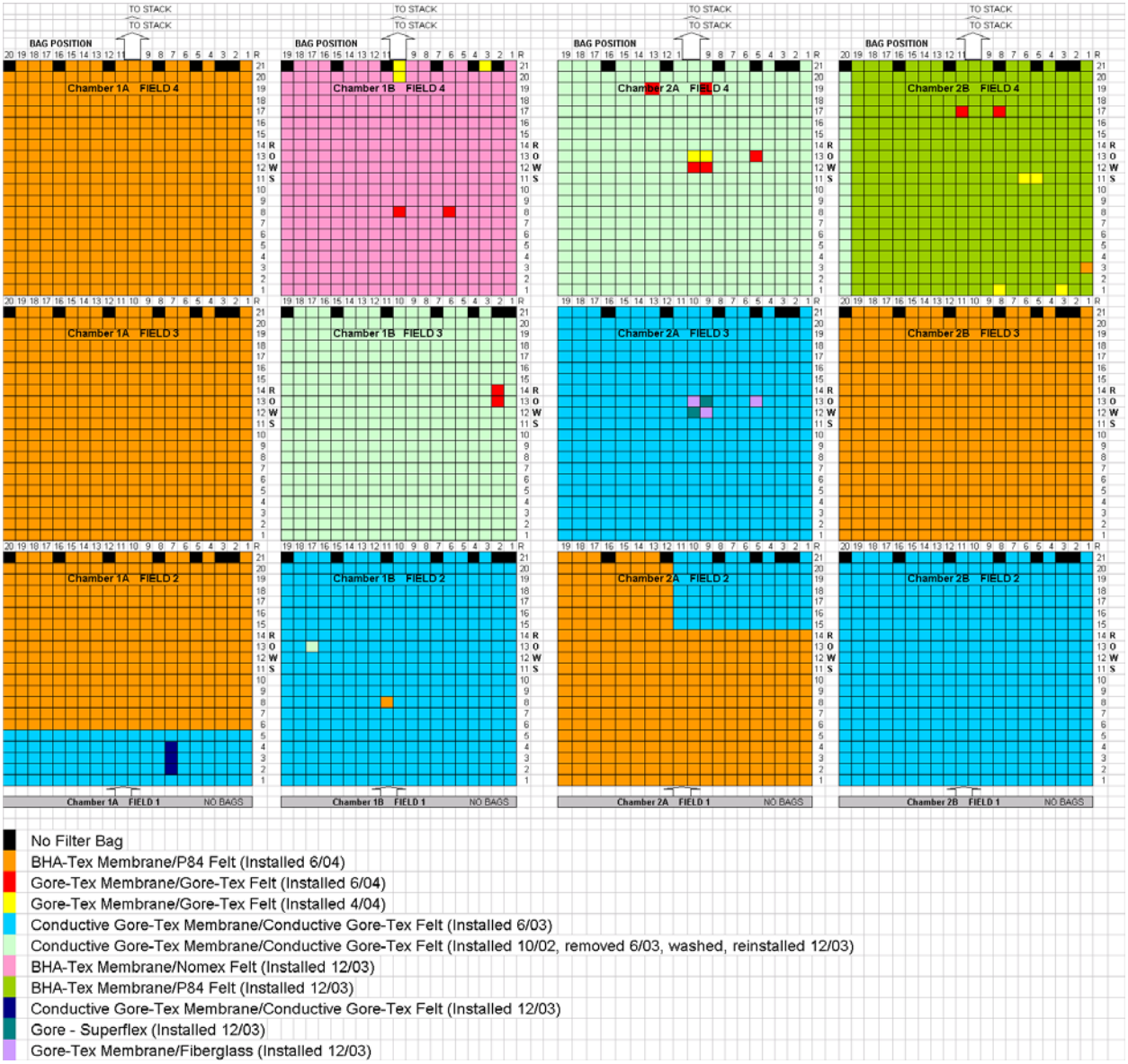
Bag layout after June 2003 boiler wash outage



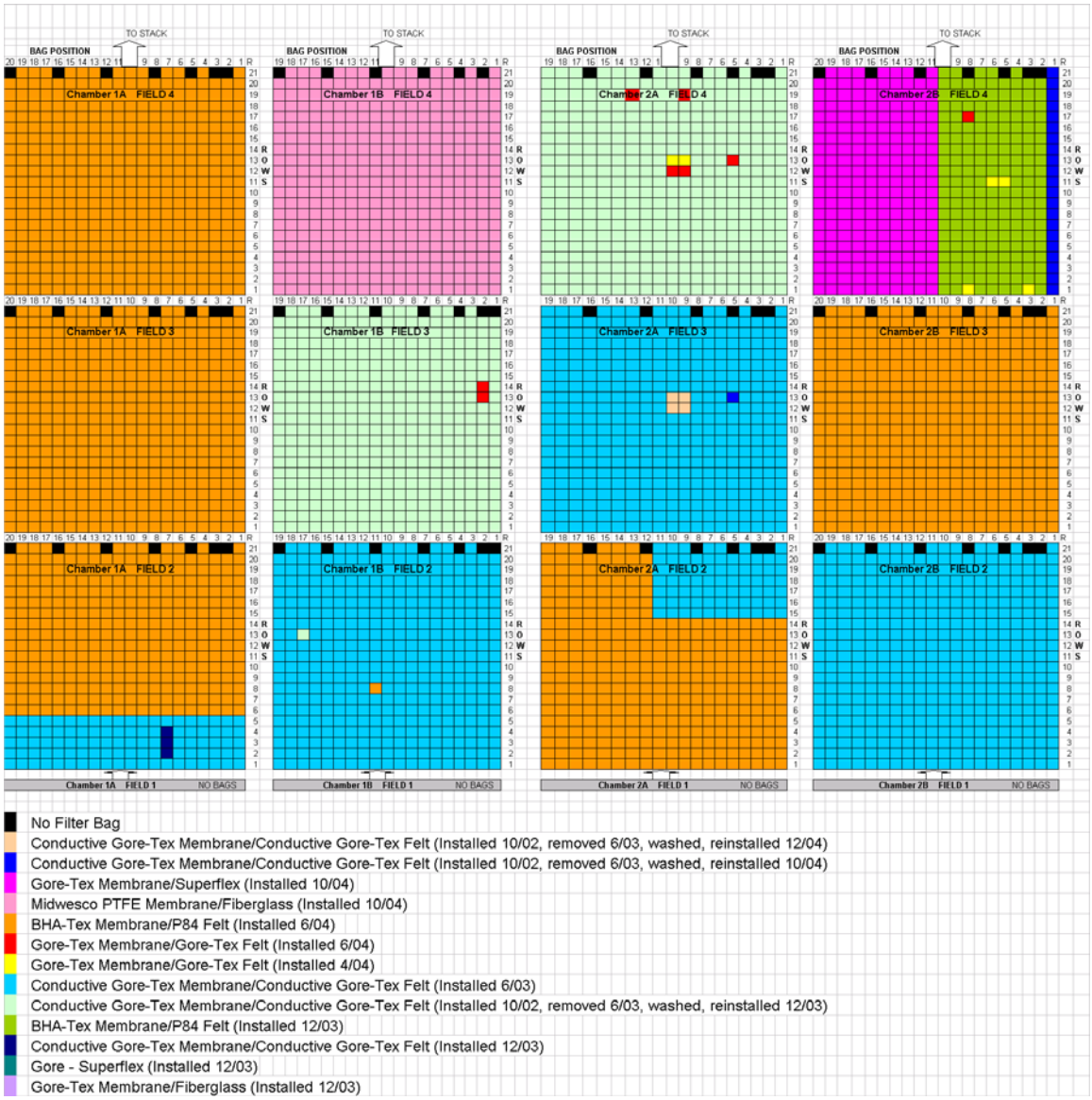
Bag layout after the December 2003 boiler wash outage



Bag layout after the June 2004 wash outage



Bag layout after the October 2004 boiler wash outage



B24 EERC Stack Test – November 19, 2002

Support in Demonstrating a Full-Scale Retrofit of the Advanced Hybrid™ Technology – TEST SERIES I

Test Series I Report

(For the period June 1, 2002 – January 22, 2003)

Prepared for:

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SAMPLING SUPPORT TO DEMONSTRATE A FULL-SCALE RETROFIT OF THE ADVANCED HYBRID™ TECHNOLOGY – TEST SERIES I

INTRODUCTION

A new concept in particulate control, called the Advanced Hybrid™ Filter, was installed at the Big Stone Power Plant operated by Otter Tail Power Company. The Advanced Hybrid™ concept combines fabric filtration and electrostatic precipitation in the same housing, providing major synergism between the two methods, both in the particulate collection step and in the transfer of dust to the hopper. The Advanced Hybrid™ Filter is designed to provide ultrahigh collection efficiency for even fine particulate matter at air-to-cloth ratios significantly higher than those utilized for traditional fabric filters, 10–12 ft/min compared to 3.5–4 ft/min for a pulse-jet baghouse. This report presents the results of the first series of flue gas sampling designed to demonstrate the fine particulate collection efficiency of the Advanced Hybrid™ Filter. In addition to total particulate measurements, trace elements including mercury, were also measured.

APPROACH

The original proposal required testing three times during the first 2 years of operation. The results presented in this report were those obtained after about 600 hours of operation. The Advanced Hybrid™ Filter began operating on October 25, 2002, and sampling occurred during the week of November 18, 2002. Table 1 shows the test matrix for the sampling conducted during this period.

Table 1. Sampling Test Matrix for Big Stone Power Plant – Test Series I

	Sampling	Nov. 18		Nov. 19		Nov. 20		Nov. 21		Nov. 22	
Activity	Location	AM	PM	AM	PM	AM	PM	AM	PM	AM	PM
Set-Up and Takedown		Setup								Takedown	
APS/SMPS[1]	Stack			APS/SMPS							
EPA Method 29[2]	Advanced Hybrid™ Inlet			X		X	X				
EPA Method 29	Stack			X		X	X				
EPA Method 17	Stack		X			X		X			
Multicyclones	Advanced Hybrid™ Inlet				X			X	X		
Impactor	Stack					X					
Coal Samples and Hopper Ash				X		X		X		X	

[1] Aerodynamic particle sizer (APS)/scanning mobility particle sizer (SMPS).
[2] U.S. Environmental Protection Agency.

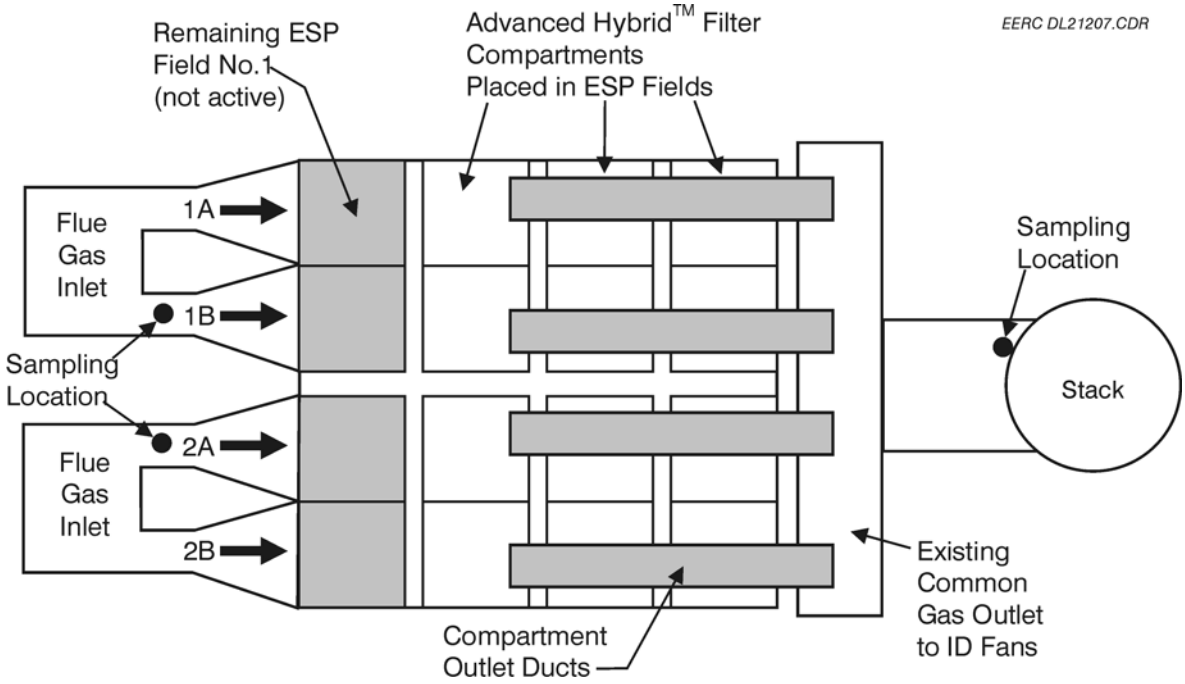


Figure 1. Schematic of the Big Stone Power Plant showing Advanced Hybrid™ System and sampling locations.

The Advanced Hybrid™ system has four chambers (1A, 1B, 2A, and 2B) with a separate duct going to each chamber. These ducts recombine at the outlet of the Advanced Hybrid™ Filter and exit a single stack. Figure 1 is a schematic of the system showing the flue gas sampling points. As can be seen in Figure 1, the Advanced Hybrid™ inlet sampling was done at two different ducts, 1B and 2A. The reason for this is that the first duct did not have a port large enough to use the multicyclone. Therefore, sampling location was changed from the second duct to the third duct. The sampling in the stack was done at a 288-ft level. There were four ports located in the stack. One port was used to do EPA Method 29 samples, and a different port was used to collect the EPA Method 17 samples. No traversing was done for these tests.

The fuel burned at the Big Stone Power Plant varies to some degree. The coal is a Powder River Basin (PRB) subbituminous coal from the Belle Ayr mine. However, periodically, the Big Stone Power Plant blends 10% or less of other combustible materials, including tire-derived fuel (TDF) and a waste seed biomass such as corn. Table 2 shows the fuel that was burned during the four days of testing.

The coal samples provided the Energy & Environmental Research Center (EERC) by plant personnel for the 4 days of testing were as follows (these samples were not taken directly at the mill, so they are different than those actually burned at the plant on any given day).

Table 2. Fuel Burned at the Big Stone Power Plant During Testing, by weight

Day	Coal, %	TDF, %	Waste Seed (Corn), %
Nov. 19	96.5	0.4	3.1
Nov. 20	100	0	0
Nov. 21	100	0	0
Nov. 22	95.0	2.2	2.8

11/18/2002 PRB–waste corn seed
11/18/2002 TDF
11/19/2002 PRB
11/20/2002 PRB
11/21/2002 PRB
11/22/2002 PRB

The TDF sample was taken prior to mixing with the coal, but the waste corn seed was blended with the coal prior to the sample being taken. The sampling protocols used for the Test Series I sampling effort are presented in Table 3. The trace elements analyzed were as follows:

Antimony
Arsenic
Beryllium
Cadmium
Chromium
Lead
Nickel
Mercury

At the Advanced Hybrid™ inlet sampling location, the EPA Method 29 and multicyclones were operated for about 2 hours. However, because of the very low emissions at the stack, the EPA Method 17 and impactor trains were operated for 12 hours to ensure enough dust was captured to accurately measure weight. To improve the detection of the trace elements at the stack, EPA Method 17 filters were analyzed, rather than the stack EPA Method 29 filters. To sample the required amount of flue gas isokineticlly, EPA Method 29 can only be operated 2–3 hours compared to 12 hours for EPA Method 17.

RESULTS AND DISCUSSION

Coal Analysis

One coal–waste corn blend sample and three PRB coal samples were analyzed for this project for trace elements and chlorides. These results are shown in Table 4. With the exception of nickel, the addition of waste corn seed to the coal reduces all the trace elements.

Table 3. Sampling Protocols Used for Test Series I

Sample Method	Analysis
EPA Method 29	Trace elements and total dust loading at the Advanced Hybrid™ inlet (fly ash and flue gas)
EPA Method 17	Trace elements and total dust loading at the stack (fly ash)
Multicyclones	Particle-size distribution at the Advanced Hybrid™ inlet
Impactor	Particle-size distribution at the stack
APS/SMPS	Particle-size distribution at the stack (0.03–15 μm)
Sample	
Hopper Ash[1]	Trace elements, XRF[2] analyses for major elements, and loss on ignition (LOI)
Coal[3]	Trace elements, ultimate/proximate, heating value and chlorine

[1] Analyses were done on three hopper ash samples.
[2] X-ray fluorescence.
[3] Analyses were done on four coal samples, 3 PRB only and 1 PRB plus waste corn seed.

Table 4. Analyses of Trace Elements in Fuel Fired at Big Stone Power Plant

Date	11/19/02	11/21/02	11/22/02	11/22/02
Trace Element	PRB Coal, μg/g	PRB Coal, μg/g	PRB Coal, μg/g	PRB and waste corn seed, μg/g
Antimony	<0.1	<0.1	<0.1	<0.1
Arsenic	0.56	1.1	0.60	0.49
Beryllium	0.21	0.27	0.26	0.15
Cadmium	0.064	0.10	0.060	<0.04
Chromium	3.5	4.3	4.3	2.84
Chloride	8.9	22.0	9.1	200
Lead	3.5	3.3	2.9	2.0
Mercury	0.087	0.0414	0.0586	0.0754
Nickel	5.3	5.8	4.2	14.8

Ultimate and proximate analyses for one PRB coal and the PRB-waste corn seed blend are shown in Table 5.

Total Dust Loadings and Particulate Collection Efficiency

The total particulate collection efficiency is shown in Table 6. As can be seen, the average collection efficiency is >99.995%. Based on the original proposal, the design specifications for the Advanced Hybrid™ Filter were <0.002 grains/scf and >99.99% collection efficiency. The results presented in Table 6 show that the Advanced Hybrid™ technology easily met these criteria.

Particle-Size Distributions

Near-real-time measurements were made for particles raging from 0.5 to 15 μm with the APS. For the APS, rather than looking at emissions of several particle sizes, fine particle emissions are combined by calculating a value for respirable mass. The American Council of Governmental and

Table 5. Chemical Analysis of Coal, as received

Date	11/19/2002	11/22/2002
Description	100% PRB	PRB and waste corn seed
Proximate Analysis		
Moisture, %	29.50	21.60
Volatile Matter, %	33.24	37.97
Fixed Carbon, %	32.95	27.18
Ash, %	4.31	13.26
Ultimate Analysis		
Hydrogen, %*	6.66	6.15
Carbon, %	48.60	53.33
Nitrogen, %	0.86	0.92
Sulfur, %	0.31	0.35
Oxygen, % (by diff.)	39.26	26.00
Heating Value, Btu/lb	8520	9658
Fd, dscf/10^6 Btu	9488	9562

*Includes hydrogen as water.

Table 6. Advanced Hybrid™ Particulate Collection Efficiency

Date	Sample Method	Advanced Hybrid™ Inlet Dust Loading, grains/scf	Advanced Hybrid™ Inlet[1] Dust Loading, lb/10^6 Btu	Stack Dust Loading, grains/scf	Stack[1] Dust Loading, lb/10^6 Btu	Particulate Collection Efficiency, %
11/18/2002	EPA Method 17			0.00002	0.00003	99.998
11/19/2002	EPA Method 29	1.02092	1.38378			
	Multicyclones	0.64099	0.86882			
11/20/2002	EPA Method 17			0.00006	0.00008	99.994
	EPA Method 29	0.85856	1.16372			
	EPA Method 29	0.92151	1.24904			
11/21/2002	EPA Method 17			0.00003	0.00004	99.997
	Multicyclones	0.66113	0.89611			
	Multicyclones	0.70044	0.94940			

[1] Values were calculated based on the Fd factors shown in Table 3 for 100% PRB.

Industrial Hygienists (ACGIH) definition of respirable mass is presented in Table 7. The ACGIH definition is extrapolated and interpolated to calculate the percentage at the midpoint of each channel for that particle size, as determined by the APS. The respirable mass from all the channels is added to obtain the total respirable mass. This provides a convenient and effective method of showing APS results for fine particle emissions. The results for the APS sampling are presented in Figures 2–4. The results show, with the exception of one spike, that the Advanced Hybrid™ respirable mass emissions are at or below those measured in the ambient air.

Table 7. ACGIH Respirable Mass Definition

Aerodynamic Diameter, μm	Respirable Mass Fraction, %
<2.0	100
2–2.5	90
2.5–3.5	75
3.5–5.0	50
5.0–10.0	25
>10	0

Particle-size distribution was measured at the Advanced Hybrid™ inlet using a 5-stage multicyclone and at the stack using an impactor. The Advanced Hybrid™ inlet multicyclone results are presented in Figure 5. As shown in Figure 5, the results for the three multicyclone samples at the inlet are similar and give a mass mean diameter of about 10 μm. The impactor results at the stack are shown in Figure 6. The results of the impactor are somewhat suspect because the total particulate loading, even after 12 hours of sampling, was so low that is was difficult to measure accurately. However, as shown in Figure 5, the mass loading measured at the stack was substantially finer. The D_{50} was <0.2 μm.

Flue Gas Analyses

The trace element analyses of the flue gas at the Advanced Hybrid™ inlet and the stack is shown in Tables 8 and 9. As would be expected based on the vapor pressure for the measured trace elements (with the exception of mercury), the vast majority of each of the trace elements is bound with the particulate matter. It should be noted that the vapor-phase lead values are somewhat suspect, as the field blanks indicated concentrations higher then would be expected. The field blank results are shown in Table 10. The field blank data shown in Table 8 are the total amount of each trace element in the impinger solutions of EPA Method 29. Table 9 represents the blanks for the gas-phase concentrations.

Comparing the Advanced Hybrid™ inlet and stack trace element analysis (Table 11) shows the Advanced Hybrid™ was extremely efficient, removing all the measured trace elements with the exception of the vapor-phase mercury. In an attempt to get a measurable quantity of trace elements, the filters from the EPA Method 17 samples were analyzed. The EPA Method 17 sample trains were operated for 12 hours, compared to only two for the EPA Method 29 trains. For all three samples taken at the stack, the trace elements, again with the exception of mercury, was at or below detection limits.

Mass Balances

In addition to the EPA Method 17 samples, fly ash samples were also taken from the hopper of the pilot-scale Advanced Hybrid™ that was running at the time. These samples were analyzed for major and trace elements as shown in Tables 12 and 13. The trace element analyses results from the ash samples compared quite well with those obtained from EPA Method 17 samples from the full-

Table 8. Analyses of Trace Elements in Flue Gas at the Advanced Hybrid™ Inlet[1,2]

Day	11/19/02			11/20/02			11/20/02		
Time	10:50			09:30			13:37		
Fuel	PRB, TDF, and Corn Seed			100% PRB			100% PRB		
Trace Element	Part.-bound, µg/Nm^3	Vapor-Phase, µg/Nm^3	Total, µg/Nm^3	Part.-bound, µg/Nm^3	Vapor-Phase, µg/Nm^3	Total, µg/Nm^3	Part.-bound, µg/Nm^3	Vapor-Phase, µg/Nm^3	Total, µg/Nm^3
Antimony	26.7	0.5	26.7	17.6	0.7	17.6	15.0	0.6	15.0
Arsenic	53.5	2.0	53.5	48.0	2.6	48.0	51.5	2.5	51.5
Beryllium	2.9	0.5	2.9	6.4	0.7	6.4	2.7	0.6	2.7
Cadmium	7.5	0.2	7.5	5.3	0.2	5.3	4.9	0.2	4.9
Chromium	49.4	1.4	50.8	49.4	0.6	50.0	66.0	1.6	67.6
Lead	251.5	4.2	255.7	215.9	2.1	218.0	210.9	3.0	216.9
Mercury	3.2	4.5	7.7	2.3	7.4	9.7	6.8	7.7	14.5
Nickel	228.5	3.2	231.7	191.7	4.3	196.0	170.2	3.7	173.9

[1] Shaded results are below detection limits. The shown values are the detection limits. Those results that are below detection limits are not added to calculate the total concentrations.
[2] Particulate-bound trace elements were based on the filters of the EPA Method 17 samples.

Table 9. Analyses of Trace Elements in Flue Gas at the Stack[1]

Day	11/19/02			11/20/02			11/20/02		
Time	11:08			09:25			13:25		
Fuel	PRB, TDF, and Corn Seed			100% PRB			100% PRB		
Trace Element	Part.-bound, µg/Nm^3	Vapor-Phase, µg/Nm^3	Total, µg/Nm^3	Part.-bound, µg/Nm^3	Vapor-Phase, µg/Nm^3	Total, µg/Nm^3	Part.-bound, µg/Nm^3	Vapor-Phase, µg/Nm^3	Total, µg/Nm^3
Antimony	<2.1	<0.5	ND[2]	<2.2	0.5	ND	<2.2	0.5	ND
Arsenic	<1.4	<1.8	ND	<1.5	1.9	ND	<1.5	<1.9	ND
Beryllium	<0.7	<0.5	ND	<0.7	0.5	ND	<0.7	0.5	ND
Cadmium	<0.05	<0.1	ND	<0.05	0.1	ND	<0.05	0.1	ND
Chromium	<0.05	0.4	0.4	<0.05	0.5	0.5	<0.05	0.5	0.5
Lead	2.5	1.5	4.0	<1.5	1.4	1.5	<1.5	<1.0	ND
Mercury	<0.05	5.4	5.4	<0.05	6.1	6.1	<0.05	6.5	6.5
Nickel	<0.05	3.0	3.0	<0.05	1.7	1.7	<0.05	1.0	1.0

[1] Shaded results are below detection limits. The shown values are the detection limits. Those results that are below detection limits are not added to calculate the total concentrations.
[2] ND (not detected) is defined as those results where both forms of the trace element are below detection limits.

scale unit. Some of these trace elements such as beryllium and chromium are very refractory and a large percentage of the total amount measured in the coal is expected to be in the bottom slag which was not analyzed. This was the case as the percentage of beryllium and chromium found in the ash compared as a function of that predicted by the coals was, 13.1% and 6.3%, respectively. The one element that would be predicted to be almost all (>99%) vaporized is mercury. Based on the average coal concentration, F_d factor, and the heating value of the coal, the mercury in the flue gas is predicted to be 12.3 µg/Nm^3 on a dry basis, the actual measured concentration is 9.7 µg/Nm^3 or a balance of 78.8%. It is also interesting to note that the antimony concentration in the coal was below detection limits but was measured in the fly ash both for both the pilot-scale and full-scale units. Using the detection limit of 0.1 µg/g in the coal, the F_d factor, and the heating value of the coal the

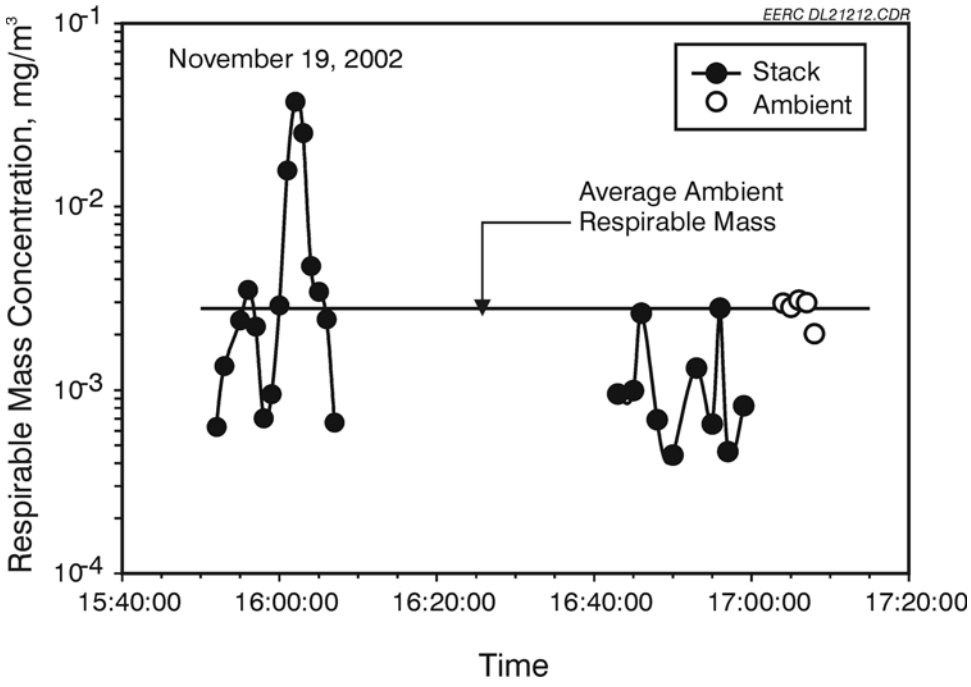


Figure 2. Respirable mass measurements at the stack of the Big Stone Power Plant for November 19, 2002.

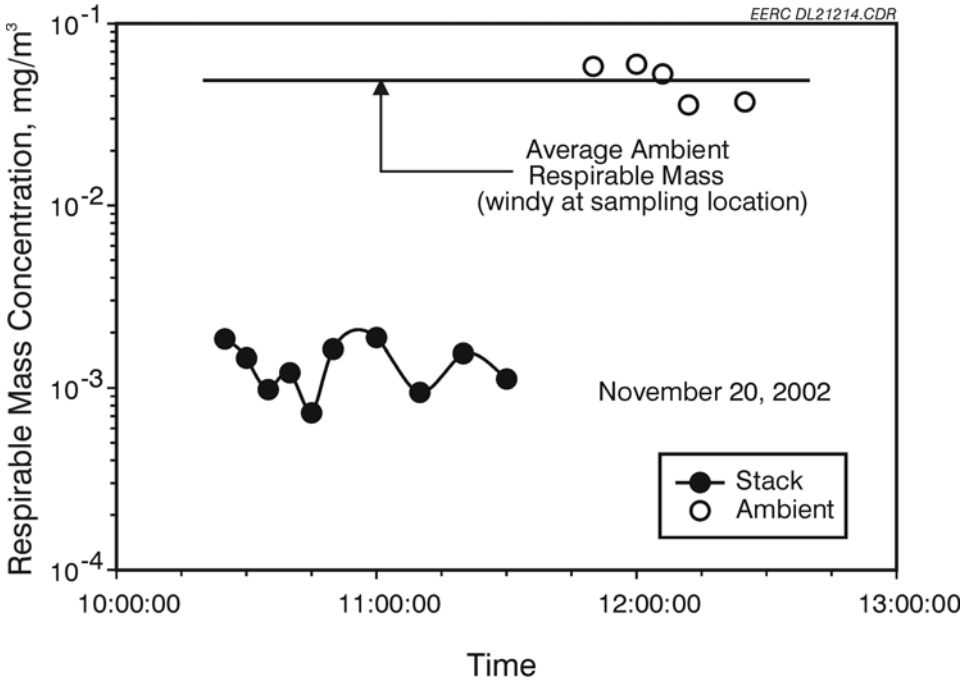


Figure 3. Respirable mass measurements at the stack of the Big Stone Power Plant for November 20, 2002.

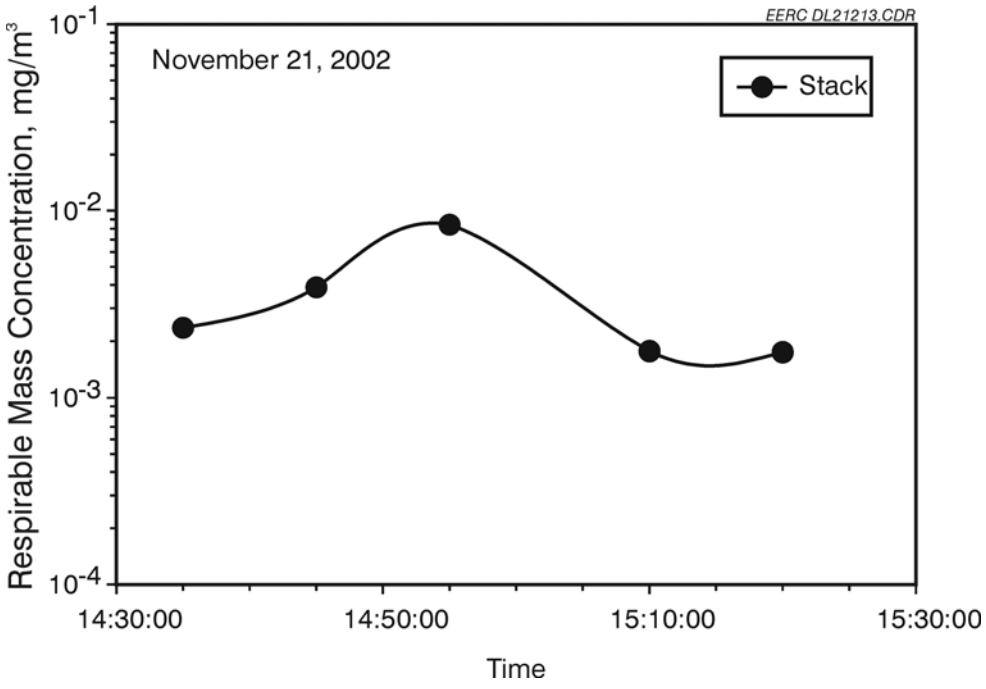


Figure 4. Respirable mass measurements at the stack of the Big Stone Power Plant for November 21, 2002.

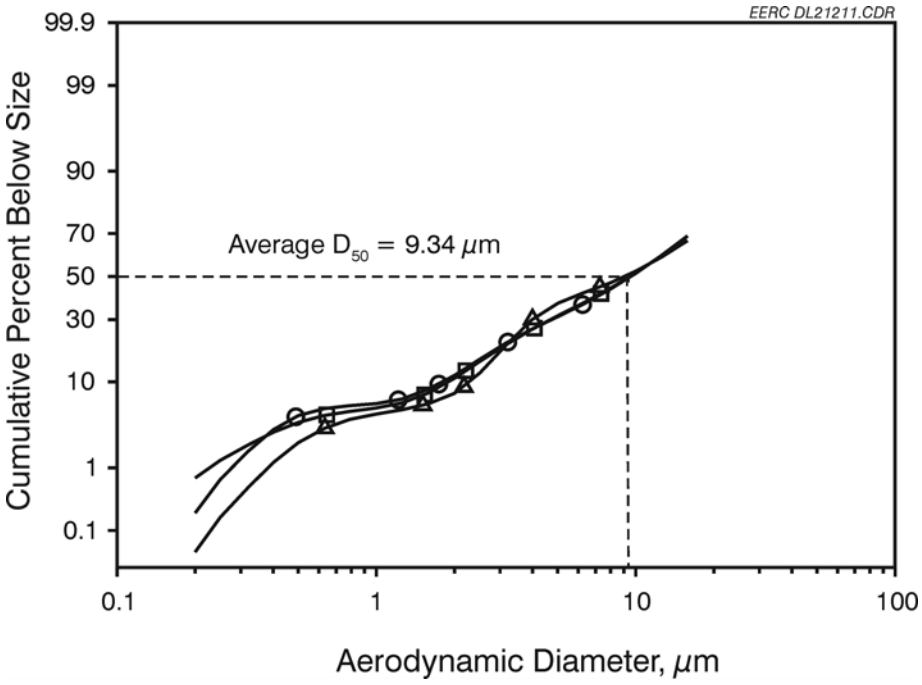


Figure 5. Particulate mass distribution at the Advanced Hybrid™ inlet based on mutlicyclone measurements.

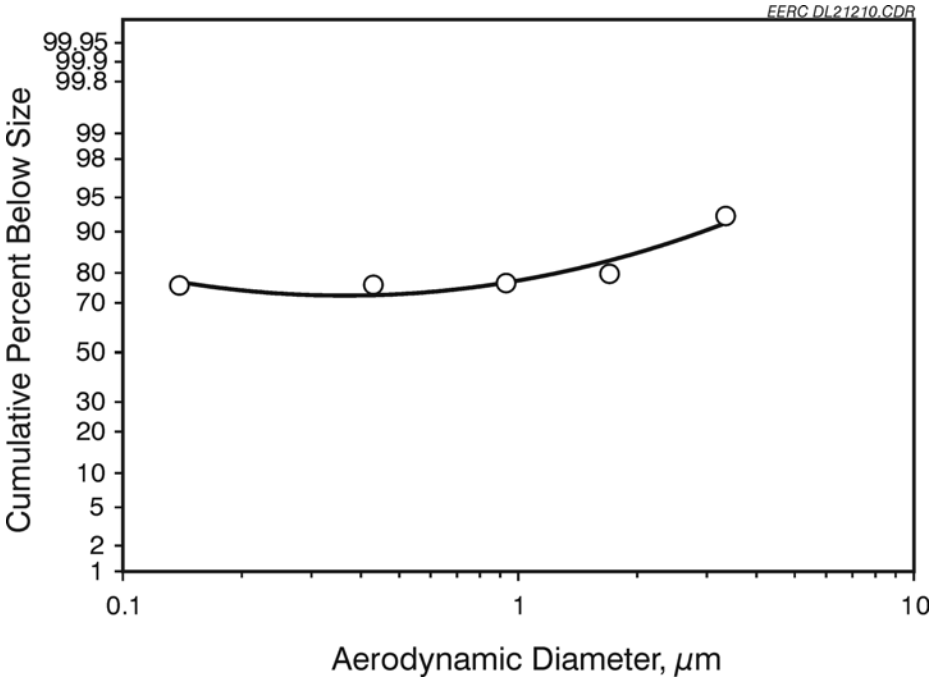


Figure 6. Particulate mass distribution at the stack based on an impactor measurement.

Table 10. Field Blank Results for EPA Method 29 Samples

	Day 1		Day 2	
Trace Element	µg	µg/Nm^3*	µg	µg/Nm^3*
Antimony	<0.05	<0.04	<0.05	<0.04
Arsenic	<2	<2	<2	<2
Beryllium	<0.5	<0.4	<0.5	<0.4
Cadmium	<0.15	<0.12	<0.15	<0.12
Chromium	0.23	0.19	0.20	0.16
Lead	3.5	3.1	3.1	2.5
Mercury	0.16	0.13	0.10	0.08
Nickel	0.85	0.69	<0.5	<0.4

*The gas concentration is calculated on the average volume of gas sampled for all the EPA Method 29 samples (1.227 Nm^3).

maximum concentration of antimony to the Advanced Hybrid™ is 19.7 µg/Nm^3. With the exception of one data point, all the measured concentrations in the ash for both the pilot- and full-scale units are just below the maximum value. Table 13 presents the major element analysis for one of the 100% PRB ashes. Also shown in Table 13 is the LOI for the three ashes.

Table 11. Comparison of the Concentration of Trace Elements at the Advanced Hybrid™ Inlet and Stack[1,2]

Day	11/19/02		11/20/02		11/20/02	
Time	11:08		09:25		13:25	
Fuel	PRB, TRF, and Corn Seed		100% PRB		100% PRB	
Trace Element	Advanced Hybrid™ Inlet, lb/10^{12} Btu	Stack, lb/10^{12} Btu	Advanced Hybrid™ Inlet, lb/10^{12} Btu	Stack, lb/10^{12} Btu	Advanced Hybrid™ Inlet, lb/10^{12} Btu	Stack, lb/10^{12} Btu
Antimony	15.8	ND[3]	10.4	ND	8.9	ND
Arsenic	31.7	ND	28.4	ND	30.5	ND
Beryllium	1.7	ND	3.8	ND	1.6	ND
Cadmium	4.4	ND	3.1	ND	2.9	ND
Chromium	30.1	0.2	29.6	0.3	40.0	0.3
Lead	151.3	2.4	129.0	0.9	128.4	ND
Mercury	4.6	3.2	5.7	3.6	8.6	3.8
Nickel	137.1	1.8	116.0	1.0	102.9	0.6

[1] All values shown are calculated based on Tables 8 and 9 and the Fd factor shown in Table 5 for 100% PRB.
[2] ND (not detected) is defined as those results where both the gas-phase and particulate bound forms of the trace elements are below detection limits.

Table 12. Trace Element Analyses of Pilot-Scale Advanced Hybrid™ Hopper Ash

Date	11/18/02		11/19/02		11/20/02	
Trace Element	µg/g	µg/Nm^3*	µg/g	µg/Nm^3*	µg/g	µg/Nm^3*
Antimony	6.7	14	6.3	14	6.9	15
Arsenic	19	41	20	43	21	45
Beryllium	1.9	4.1	2.2	4.72	1.9	4.08
Cadmium	2.1	4.5	2.1	4.5	2.1	4.5
Chromium	20	43	24	51	28	60
Lead	78.7	169	77.5	166	84.0	180
Mercury	0.655	1.41	0.564	1.21	0.551	1.18
Nickel	95	204	93	199	84	180

* The gas concentration is calculated on an average dust loading of 0.93664 gr/scf to the Advanced Hybrid™ hopper (from EPA Method 17 samples on full-scale unit).

CONCLUSIONS

From the data, the primary conclusion was that the Advanced Hybrid™ technology is extremely efficient in removing particulate matter. The particulate efficiency is substantially better than the designed basis of 99.990%. The average particulate collection efficiency was 99.997%. The outlet dust loading was almost an order of magnitude lower than the proposed limit of 0.002 grain/scf. As would be expected from a concept that provides ultra-high collection efficiency for particulate matter, the Advanced Hybrid™ Filter removed those trace elements associated with the particulate matter at very high efficiencies as well. As measured at the stack, all trace elements, with the exception of mercury, were near or below detection limits.

Table 13. Elemental Analysis of Advanced Hybrid™ Pilot-Scale Hopper Ash, 100% PRB Coal

Date Sampled	11/18/02	11/19/02	11/20/02
Oxide	%	%	%
SiO_2		20.9	
Al_2O_3		16.1	
Fe_2O_3		7.30	
CaO		34.8	
MgO		5.93	
Na_2O		3.14	
K_2O		0.80	
P_2O_5		2.87	
TiO_2		1.58	
BaO		1.18	
MnO		0.07	
SrO		0.53	
SO_3		4.83	
LOI	0.86	0.72	1.11
Cu, mg/kg		370	
V, mg/kg		300	
Zn, mg/kg		2170	

B25 E-mail from Stan Miller on soybean burn

Hrdlicka, Thomas

From: Miller, Stanley J. [smiller@undeerc.org]

Sent: Friday, April 11, 2003 11:07 AM

To: Swanson, William; Hrdlicka, Thomas; Rich Gebert (rgebert@wlgore.com); Dwight R. Davis (ddavis@wlgore.com); Craig Rinschler (P.E.) (crinschl@wlgore.com); Rick Bucher (rbucher@wlgore.com)

Cc: Jones, Michael L.; Olderbak, Michelle

Subject: Effect of Soy Bean Burning on AH performance

I received two samples from Rich of ash brushed from the bags removed in the full-scale Big Stone AH in November and March. Our first XRF analysis shows the November potassium level to be 0.4% compared to 3.2% for the March bag sample. Keep in mind that these samples would likely be a mixture of the entire dust cake going back to start up so at times the actual potassium level of additional ash on the surface may be much higher. The sulfate level was also much higher for the March sample. We are doing some additional scanning electron microscopy analysis of undisturbed ash from a bag sample which may provide further insight as to the effect of the high potassium levels.

I also looked at the pilot-scale data from February and saw an immediate increase in residual drag and decrease in bag cleaning interval on Feb 4, which is the day when there was a large increase in the amount of waste seeds being burned. The pilot unit was operated until Feb 11, but much of the operation was with single bank and a short pulse interval. However, before shutting down, we operated for about a day in baseline conditions again. By this time the residual drag and bag cleaning interval had deteriorated even more. The waste seed rate feed rate from Feb 5 to 11 was 260 to 315 tons per day. From Feb 12 until Feb 23 the seed feed rate was increased significantly and was over 800 tons per day from Feb 21 to 23.

All of this points to the waste seed burning as having a significant negative effect on the pressure drop.

It should also be noted that in the EERC small-scale pilot tests in January, we saw higher pressure drop when we increased the rate of TDF up to 10%. This is higher than the 5% that is occasionally burned at Big Stone, but it is another indication that alternative fuel burning can have a very negative effect on the pressure drop.

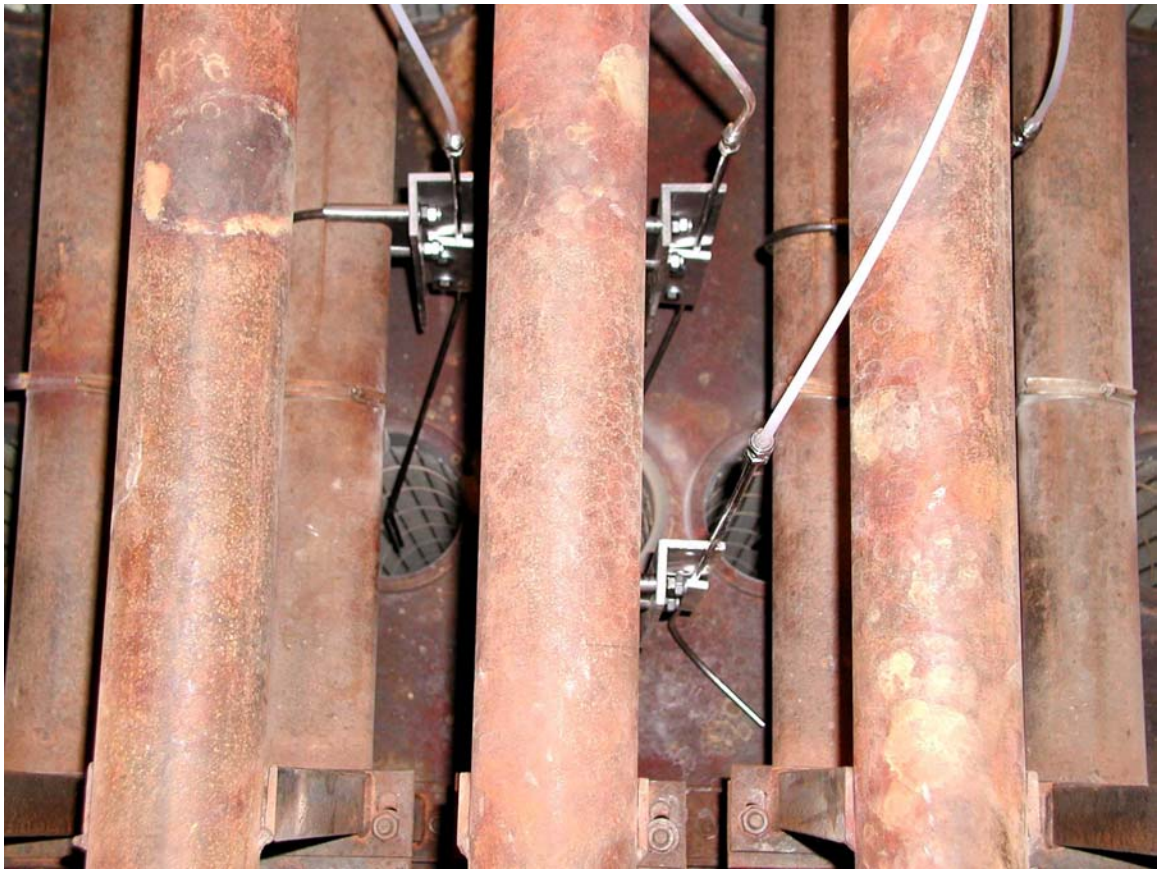
I suggest that all waste seed and TDF burning be stopped at the plant, at least until the pressure drop issues are solved. This is especially important for the time immediately after washing the bags. It may be shown in the future that a level of alternative fuels can be tolerated, but for the near term if we are looking for all ways to minimize pressure drop, it seems to be the way to go.

I will be out of the office on vacation from April 14 through 22, but can be reached if necessary.

Thanks,

Stan

B26 Photographs of pitot tube equipment



B27 Specific pitot tube information

Pitot Tube in a Filter Bag, Gas Flow Measurement Device
Big Stone Application with 19 inch Spacing between Blowpipe and Tubesheet

Revised on May 28, 2003

Material List

Material	Size	Quantity
304 stainless steel tubing	ID 0.12 inch, OD 0.25 inch x 0.065 inch wall Length of each piece 40 inch	10
U bolt clamp steel	3.0 inch diameter steel pipe with 3.5" O.D. Bolt spacing 4.0 inch McMaster-Carr # 3042T21	10
Aluminum or steel angle for Plate Mount	1.5" x 2.0"x 12"x 0.25"	10
Aluminum or steel bar for Plate Clamp	1.5 " x 6" x 0.25"	10
Steel Bolts	5/16 x 18 x 1.25"	20
Steel locking nuts (optional)	5/16 x 18 steel locking	20
Flat steel washers	5/16	20
Flat steel washers	3/8	20
Steel locking nuts (for 500F), (optional)	3/8 steel locking	20

Instructions:

304 stainless steel tubing

- Cut to 40 inch length
- Create round nose on one end (radius of 0.100-0.125 inch) from center of tubing
- Make 2 bends in same plane ,45 degrees each, as per drawing .
- First bend 45 degrees 10 inches from Nose of tubing
- Second bend 45 degrees 10 inches from previous bend in opposite direction.
- With tubing cutter cut and trim end of tubing for compression fitting

Aluminum or steel angle for Plate Mount 1.5" x 2.0"x 12"x 0.25"

- Drill 2 through holes oversize for 3/8 inch diameter U bolt.
- Drill 2 through holes over size for 5/16 x 18 bolts
- Machine groove (0.125 inch radius) to (0.080 inch depth) for ¼ inch OD tubing

Aluminum or steel bar for Plate Clamp 1.5 " x 6" x 0.25"

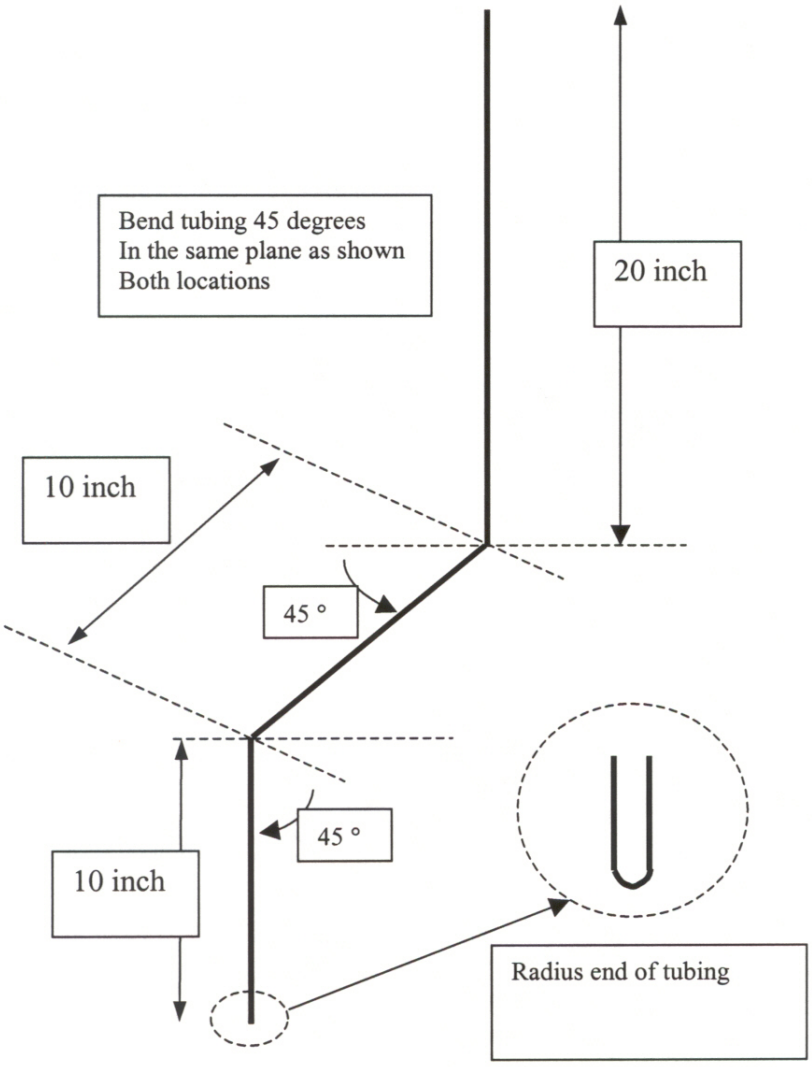
- Drill 2 through holes over size for 5/16 x 18 bolts
- Machine groove (0.125 inch radius) to (0.080 inch depth) for ¼ inch OD tubing

Bag Flow Pitot Tube Measurement Device

Tubing – Pitot Tube

304 stainless steel tubing 40 inch length

- Create round nose on one end (radius of 0.100-0.125 inch) from center of tubing
- Make 2 bends in same plane ,45 degrees each, as per drawing .
- First bend 45 degrees 10 inches from Nose of tubing
- Second bend 45 degrees 10 inches from previous bend in opposite direction.
- Debur opposite end of tubing for compression fitting



Bag Flow Pitot Tube Measurement Device

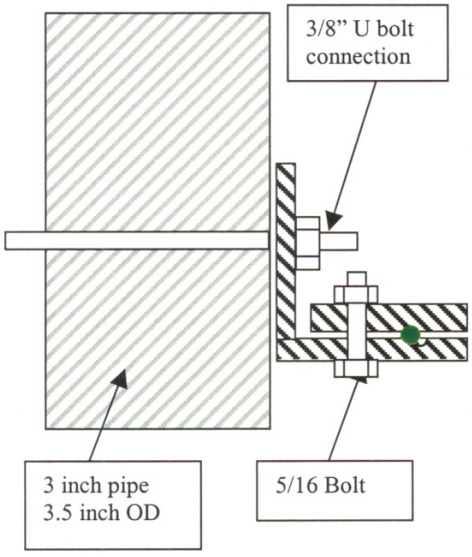
Plate Mount

Aluminum or steel angle for Plate Mount
1.5" x 2.0"x 12"x 0.25"

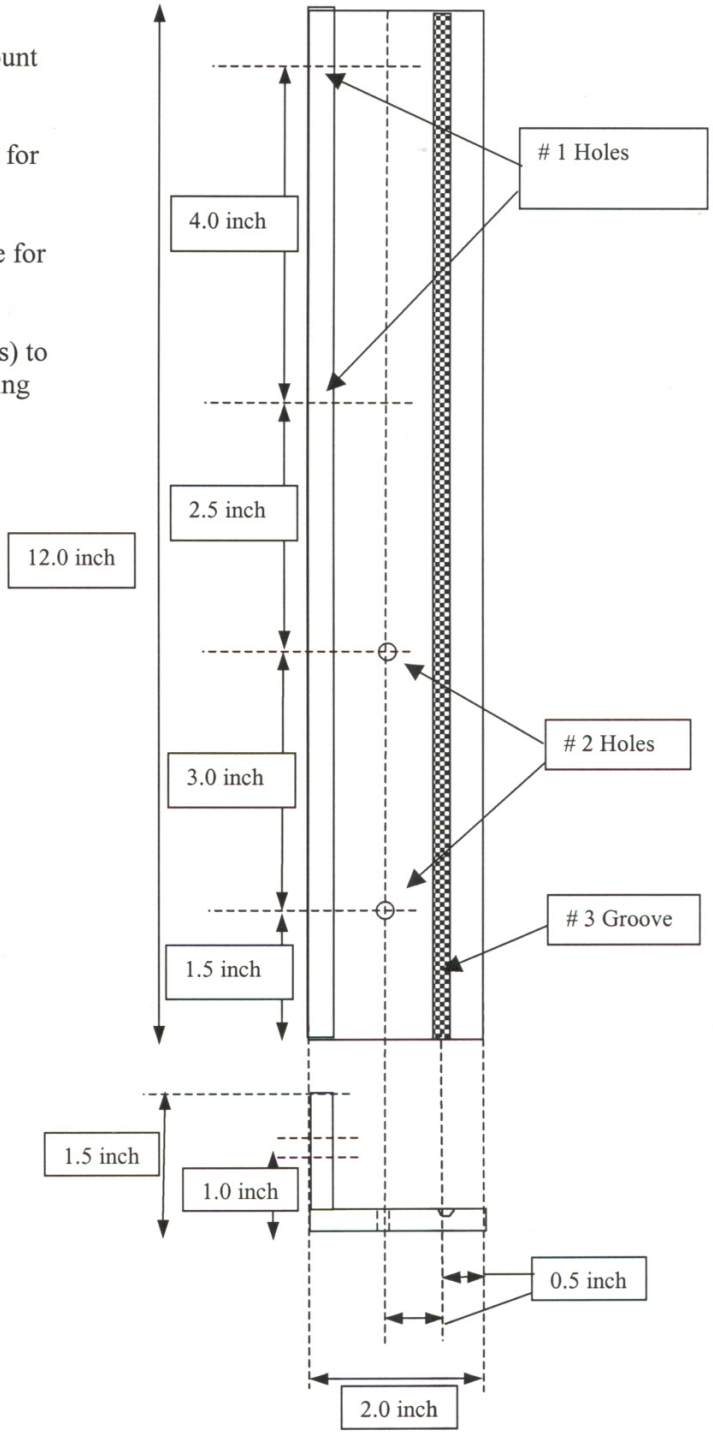
1. Drill 2 through holes and oversize for 3/8 inch diameter U bolt.

2. Drill 2 through holes and over size for 5/16 x 18 bolts

3. Machine groove (0.125 inch radius) to (0.080 inch depth) for ¼ inch OD tubing



Assembly Drawing



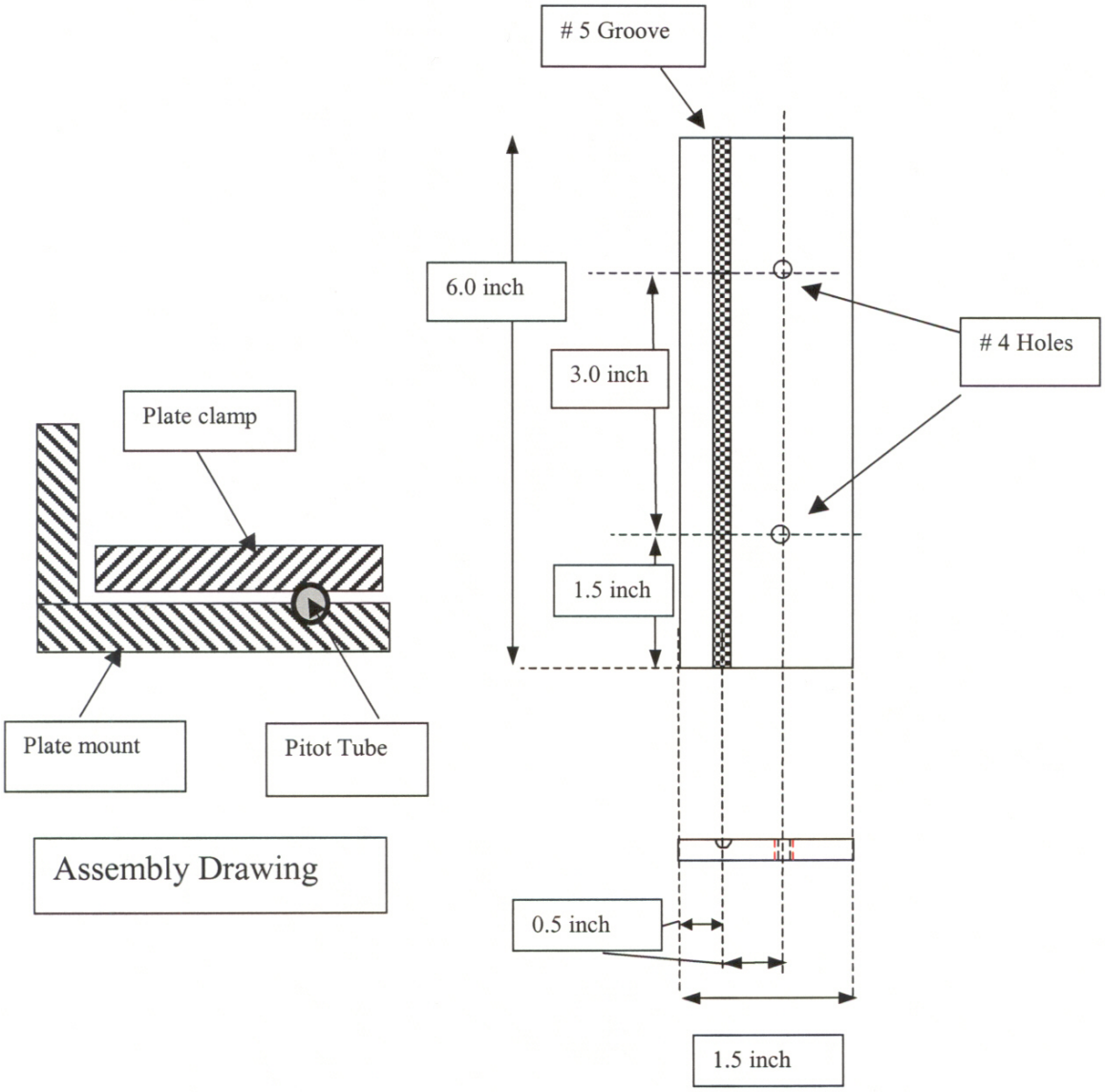
Bag Flow Pitot Tube Measurement Device

Plate Clamp

Aluminum or steel bar for Plate Clamp 1.5 " x 6" x 0.25"

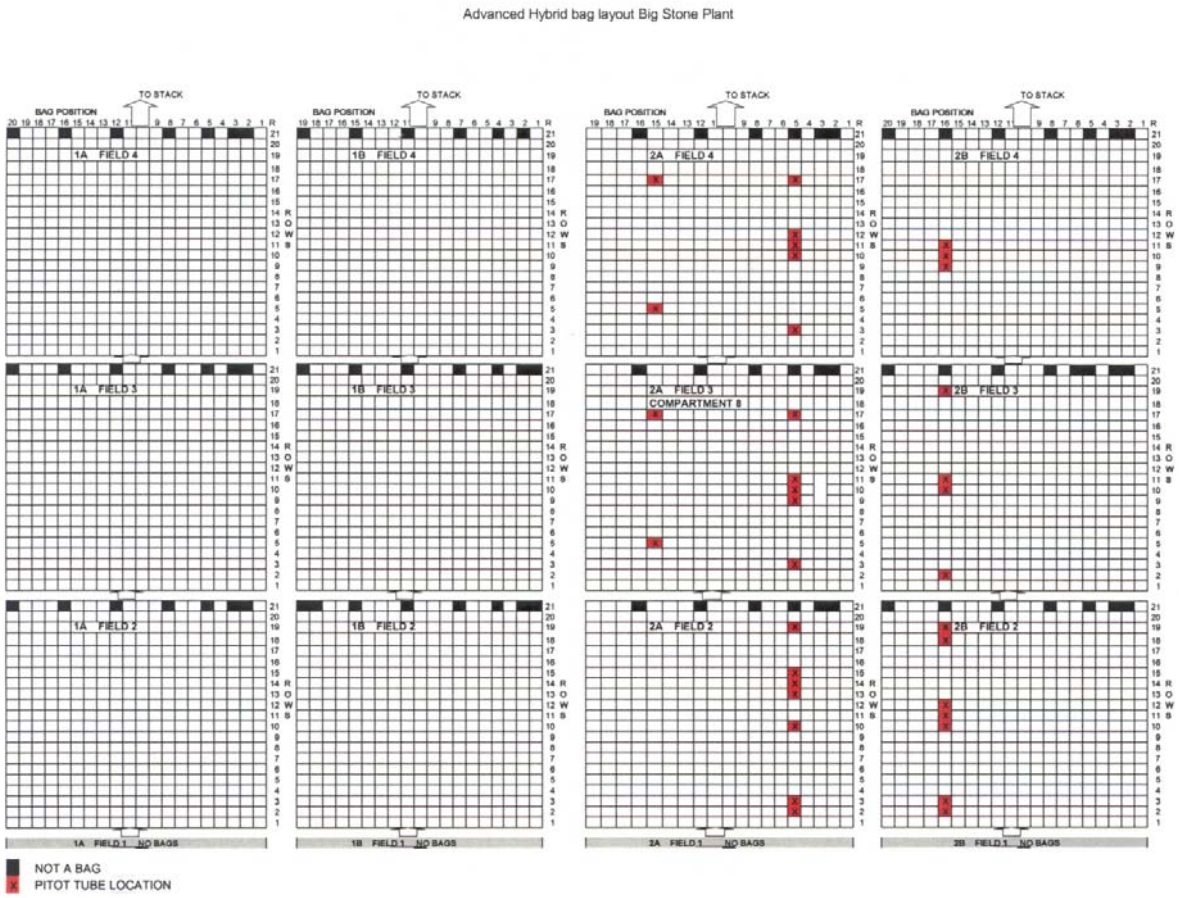
4. Drill 2 through holes over size for 5/16 x 18 bolts

5. Machine 0.125 inch radius groove 0.080 inch depth for ¼ inch tubing

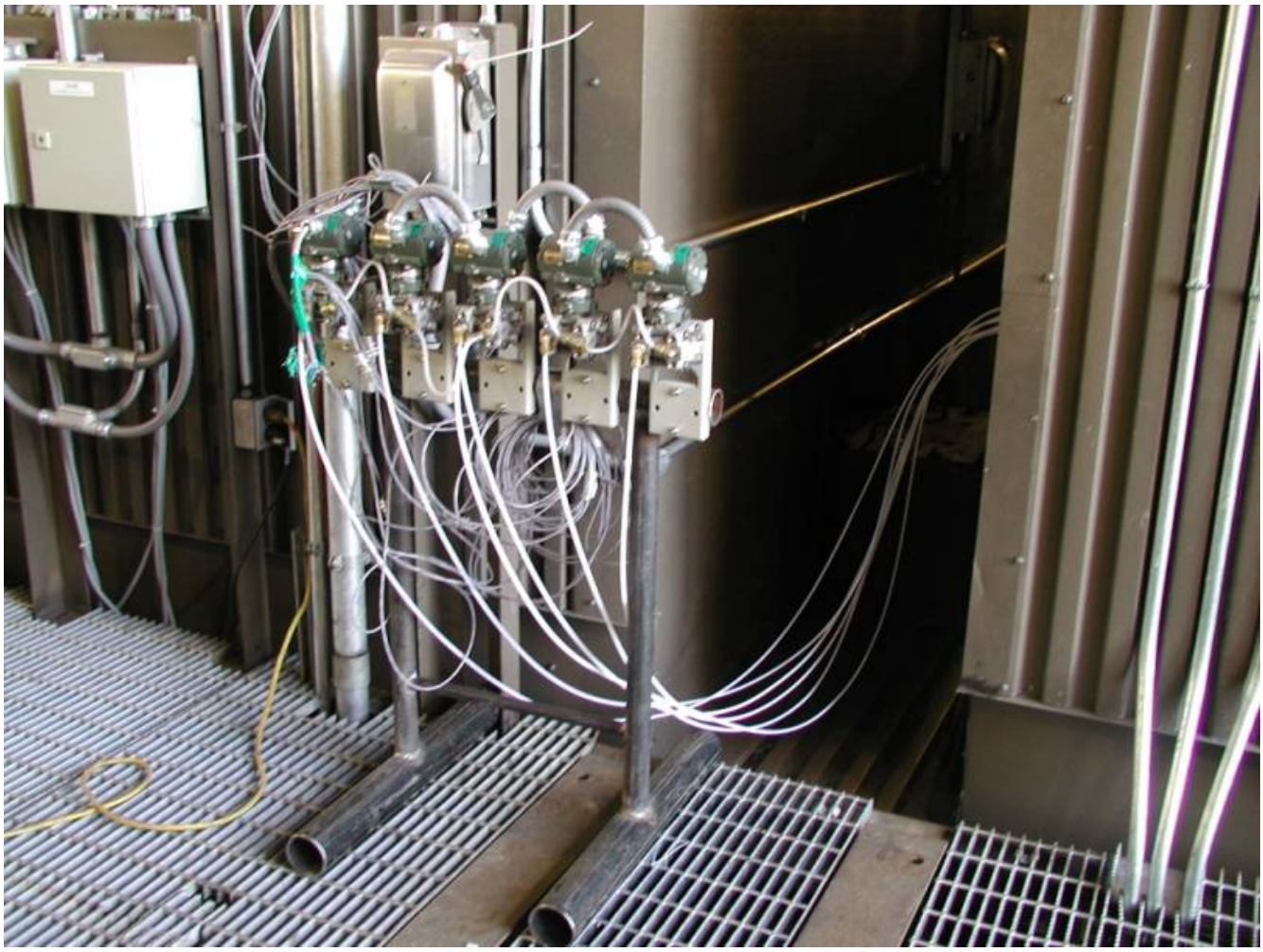


Assembly Drawing

B28 Specific Pitot Tube Placement on Bag Layout Diagram



B29 Photographs of pitot tube transmitters



B30 Pictures from April 29 bag wash in Chamber 2B

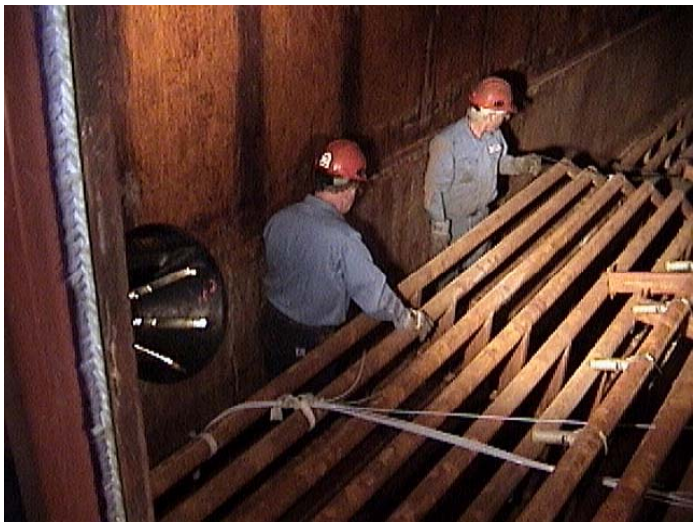
April 29,2003

Big Stone Plant

AHPC Bag Wash

OK, these are Confined Spaces, everyone sign on the Permit

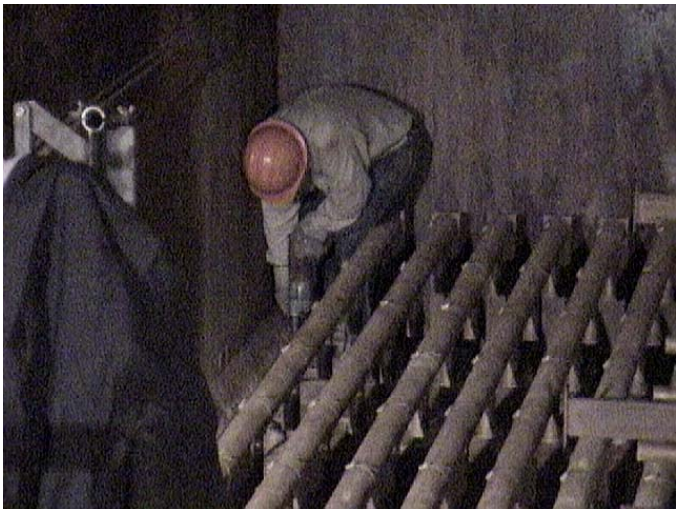
Work begins – Blowpipe removal



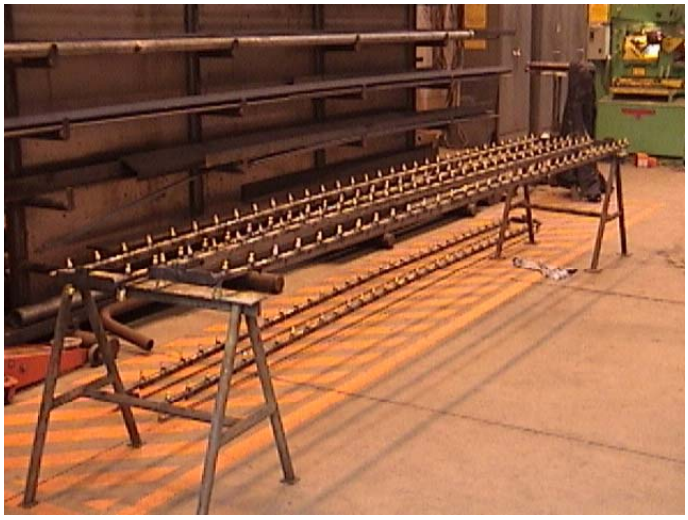
Safety – Make sure the TR Set is Grounded out

Blowpipe's out

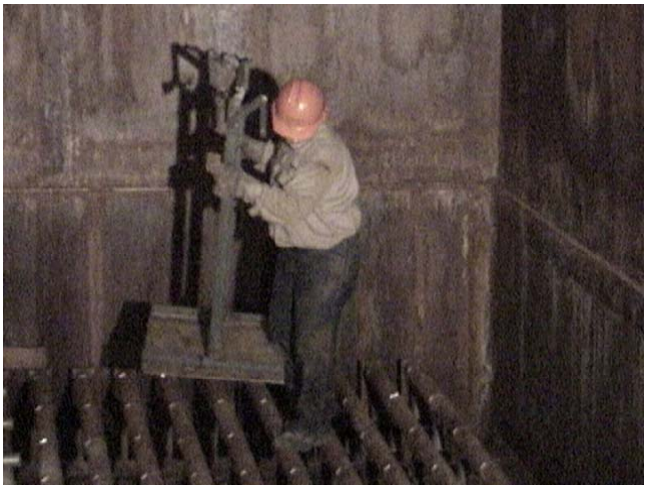
Drilling access holes for the wash (126 of em')



The Wash headers standby - Ready for Service



Getting ready to wash – Setting up the hoists



Crews preparing to enter the Gas path compartments

AHPC Wash

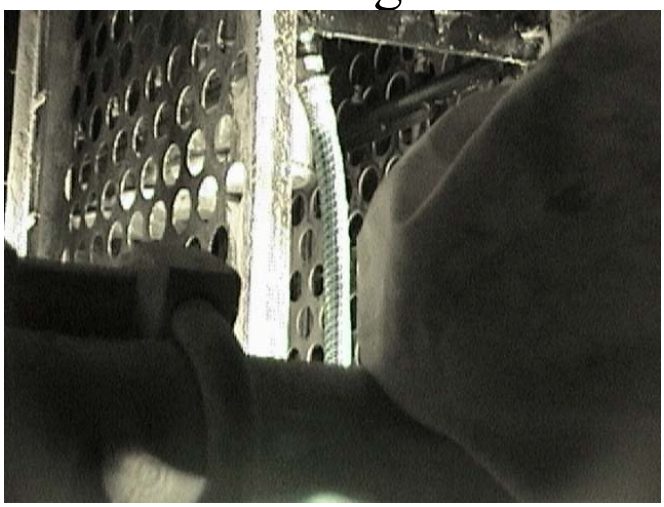
- Building staging in the first compartment.

Looking straight up – staging built in compartment A

Guide bar removal

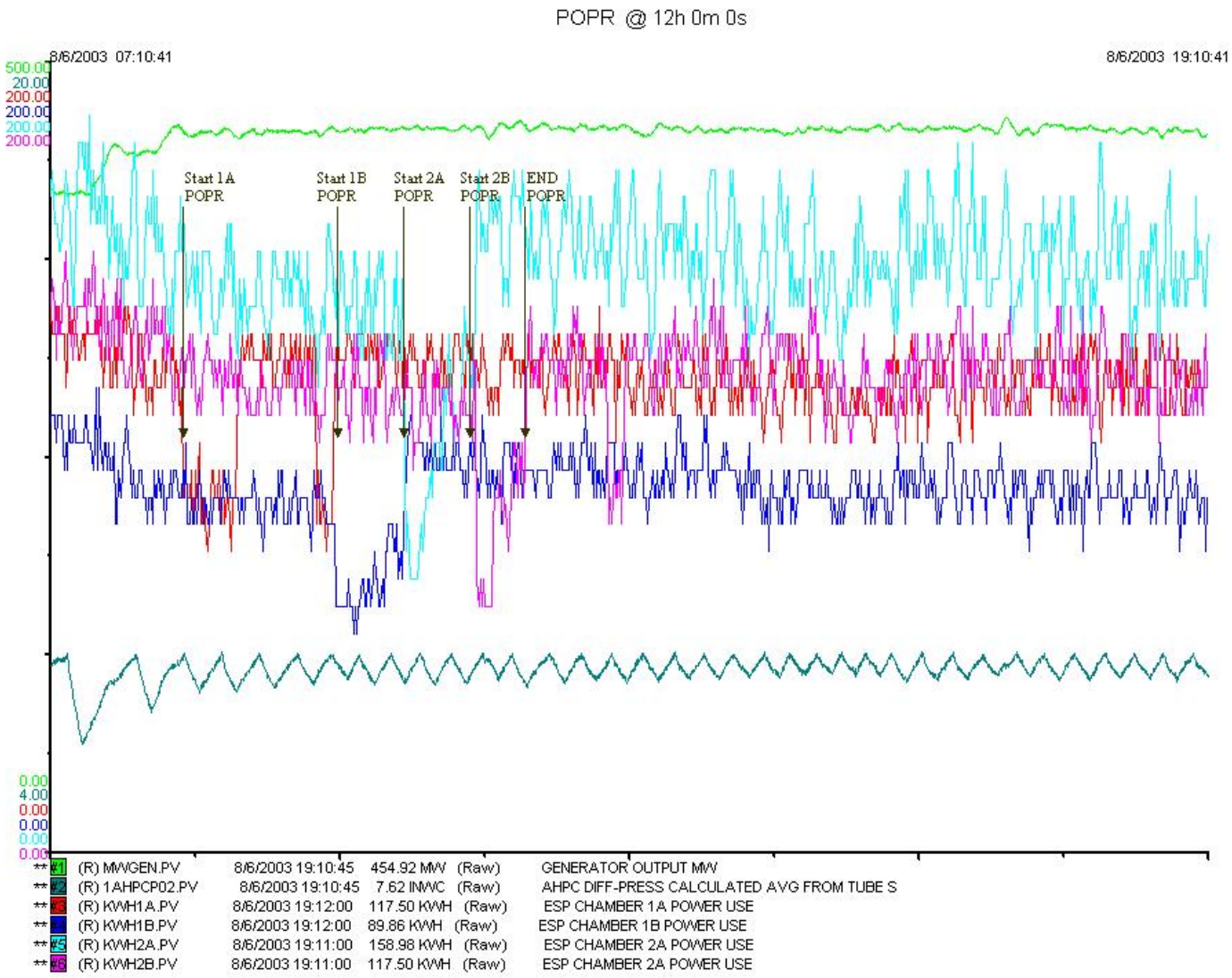
Winching system set for action

Wash header in place ready for hoisting

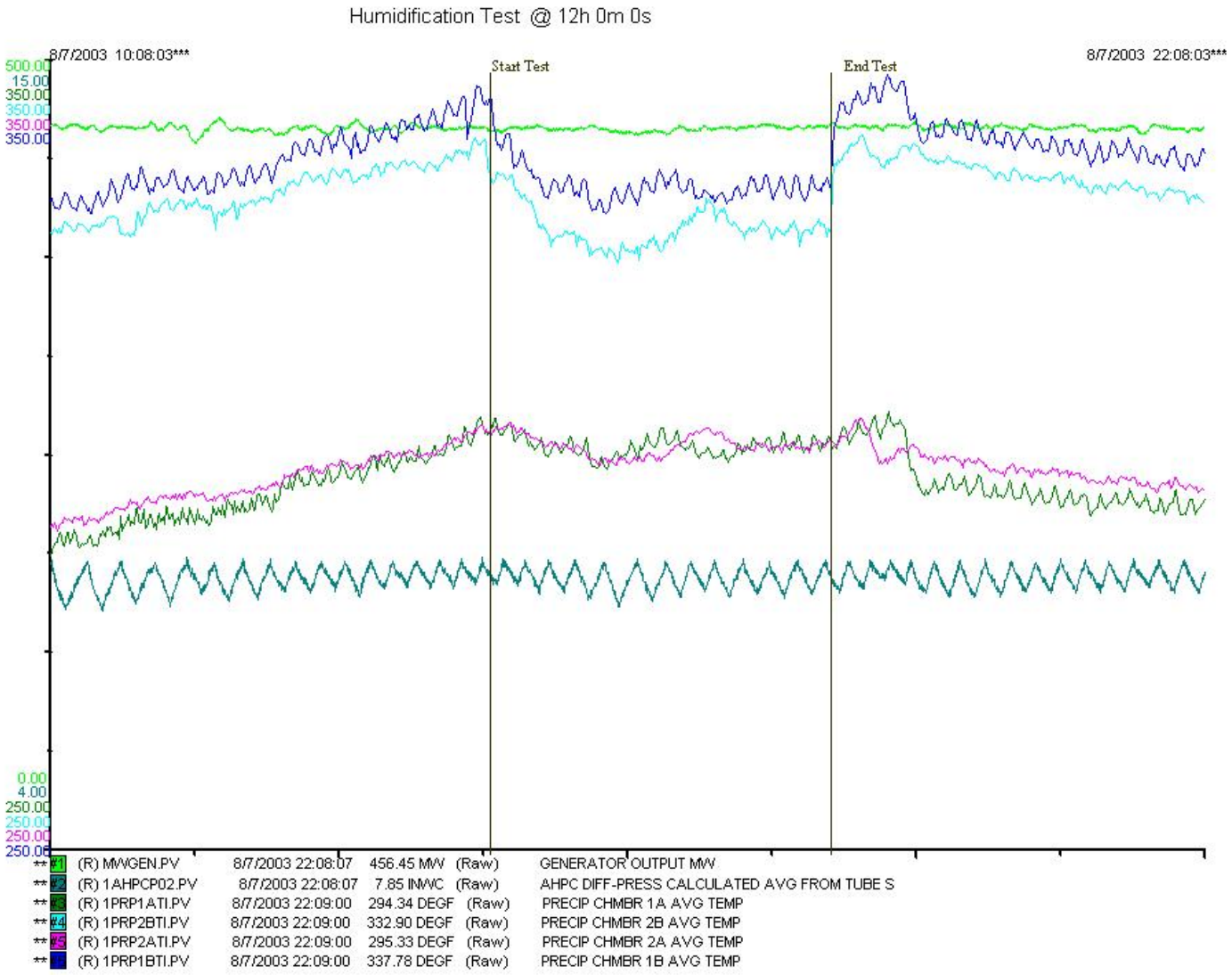


Hoisting the wash rack

B31 POPR Test Results



B32 Humidification Test Results



B33 Fluent Study

Background

The Advanced Hybrid Particulate Collector (AHPC) is a novel technology that combines the best features of electrostatic precipitators and fabric filters. Demonstration of a full-scale retro-fit of the AHPC technology is taking place at the $450MW_e$ coal-fired Big Stone power plant near Milbank, SD. The full-scale unit is demonstrating consistent high particulate collection efficiencies (>99.99%) that far exceed that of a conventional electrostatic precipitator (ESP). However, the demonstration unit does experience problems with higher than expected pressure drops (Δp) and substantial variations in particle loading. These problems have lead to: *(i)* lowered power production due to limitations of the existing fan capacity and *(ii)* rapid cleaning frequency for the fabric filter bags.

The US Department of Energy (NETL), Otter Tail Power Company (who operates the Big Stone plant), and the parties involved in developing the AHPC technology are discussing several short and long term modifications to overcome the abovementioned problems. Since the uneven loading of fabric filter bags is believed to be largely a flow distribution problem, `Fluent Inc.` has been commissioned to propose a set of Computational Fluid Dynamics (CFD) studies to assist in the implementation of design modifications that ensure a better distribution of flow in the unit.

This technical memorandum is a project deliverable for this preliminary study. It presents a problem analysis and conclusions in the form of proposed CFD studies of the Big Stone AHPC unit.

Description of Big Stone AHPC Unit

The AHPC installation at Big stone consist of four parallel chambers retrofitted downstream of an existing ESP. Each chamber holds one existing ESP field and three AHPC filter compartments. Figure 1 gives a schematic representation of this arrangement. The AHPC compartments have 20 rows with 21 fabric filter bags each[1]. Electrostatic charge electrodes are suspended between the rows of bags, with perforated collecting plates separating the fabric filter and ESP zones.

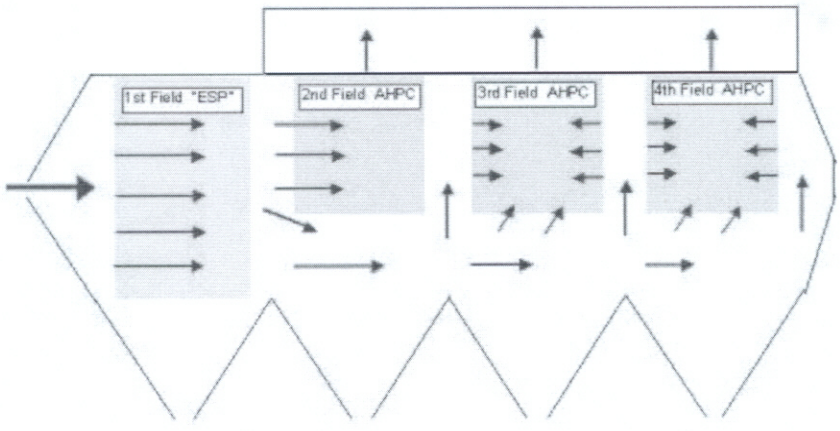


Figure 1: Big Stone AHPC unit. Arrows indicating assumed flow patterns.

[1] This translates to $3 \times 20 \times 21 = 1260$ bags per chamber.

As the old ESP unit is 40ft tall and the new AHPC compartments take up less height (24ft), flow may reach the compartments by way of the space below the retrofitted parts. From there, flow may either enter the ESP zones directly or via the spacing that separates the individual compartments. Thus, flow may enter the individual AHPC compartments from three directions: front, bottom, and back. To maximize the efficiency of the build-in ESP zones, it is desirable to have stratified flow (from one direction) with a reasonable residence time between the collecting plates. Furthermore, localized high velocities and turbulence levels should be avoided in order to prevent re-entrainment of fly ash.

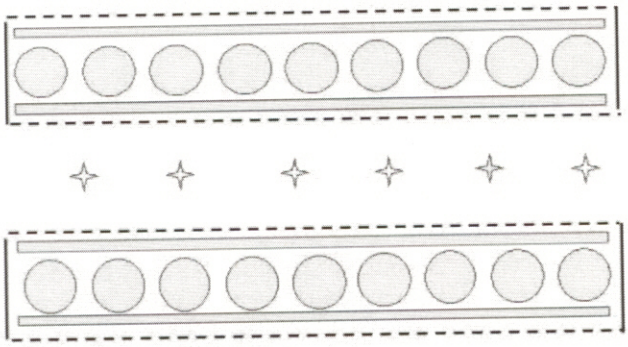


Figure 2: Schematic bottom-view of filter sections. Pictured is an ESP section bounded by two bag rows and their guide rails.

An additional flow-related problem is that of potential *gas sneakage*, i.e. flue gas by-passing the ESP zone and entering the filter bag sections directly. This is an undesired phenomenon, made possible by the lack of a physical separation at the bottom of the filter bag sections.[2] Gas sneakage will lead to higher particle loading of the filter bags, and so may be a contributing factor to the quick dustcake build-up being observed.

Proposed CFD studies

In the following, an overview of the proposed flow modeling of the Big Stone AHPC unit is presented. It is suggested to split this work into three distinct tasks:

1. Modeling of overall flow distribution in the *existing* unit
2. Modeling of overall flow distribution in the *modified* unit
3. Detailed modeling of simplified filter compartment

Tasks 1 and 2 will aim at respectively understanding and correcting the overall flow in an entire chamber, while Task 3 will address the abovementioned phenomenon of gas sneakage by means of a detailed CFD model for part of an advanced hybrid compartment. In the following, the technical approach for each of these tasks will be explained in more detail. Finally, Section 4 summarizes work effort, deliverables, and a time schedule for the proposed tasks.

[2] Metal disks block the bottom of filter bags and there is a set of two guide rails per bag row. A simple analysis shows that this leaves approximately half the surrounding face open to up-coming flow.

TASK 1: Simulation of existing AHPC design

This task aims at predicting overall flow patterns in the existing Big Stone AHPC unit. The CFD simulation will provide information on the directional partitioning of flow entering the individual AHPC compartments, and will help spot regions with localized high velocities that may have a detrimental effect on ESP performance. The insight into flow patterns gained from this task, may serve in the development and refinement of flow correcting design modifications. The impact of these design modifications will subsequently be evaluated in Task 2.

While designing the AHPC retrofit for the Big Stone power plant, Elex AG conducted CFD simulations of a full chamber, similar to what is proposed as Task 1 here. At that time, the model size was severely limited by the available computer resources.[3] However, the Computer Aided Design (CAD) model developed in that context will serve as a good starting point for the current effort. Section 1.1 outlines the CFD modeling approach, and explains the improvements over the Elex model that we intend to implement.

1.1 Modeling approach

The advanced hybrid filter is a complex system both in terms of geometry and involved physics, for which reason certain simplifications are necessary. As regards physical modeling, simulations will consider isothermal single-phase gas flow. That means, no attempt will be made to model the entrainment of fly ash particles in the flue gas. At the same time this relieves any need to include models for the electro-magnetic field and charge-carrying ability of ash particles. Most coal-derived flue gases are sufficiently dilute to warrant the assumption that the presence of particles does not influence the gas flow.

The pressure drop across the thin fabric filter membranes is modeled using a porous jump condition in the Fluent CFD code. The thin porous medium has a finite thickness over which the pressure change is defined by a combination of Darcy's Law and an additional inertial loss term.

$$\Delta p = - \left(\frac{\mu}{\alpha} v + C_2 \frac{1}{2} \rho v^2 \right) \Delta m \tag{1}$$

where μ is the molecular fluid viscosity, α is the medium permeability, C_2 is the pressure-jump coefficient, v is the velocity normal to the porous face, and Δm is the medium thickness. Parameters for the porous jump model will be assigned values based on existing measurements of filter bag pressure drops. For the purpose of overall flow modeling (Tasks 1 and 2), the pressure drop across the perforated collecting plates and the fabric filters are lumped. This means that a simple rectangular box represents one row of filter bags and the plates bounding it.[4]

1.1.1 Geometric modeling and meshing

The first step will consist in modifying the existing CAD-model so that it corresponds more accurately to the actual retrofit geometry. Here is a commented list of the geometry changes that will be implemented:

[3] Simulations were carried out using Fluent 5.5 on a 500 MHz Pentium III processor with 1 Gb memory.

[4] The slender rectangular boxes have porous sides (exception being the outermost bag rows in each compartment that have one solid side), a porous bottom, a solid front and back, and an open top face leading to the clean gas plenums.

- Add collecting plates for old ESP field

  The original ESP remains in operation, but its collecting plates were not contained in the exisiting CFD model. However, these solid plates (spaced $1ft$ apart), are poised to efficiently stratify the gas flow in its approach to the AHPC compartments. The plates will be modeled as solid walls of infinitesimal thickness.

- Remove girdles from two rear AHPC compartments

  In the CFD model created by Elex, there is a $400mm$ high rectangular plate placed perpendicular to the direction of the incoming flow just below the front of each AHPC field. This component (referred to as a girdle) is related to the rapping system that cleans dust of the collecting plates. However, in the actual Big Stone retrofit there is only one such girdle placed in connection with the first AHPC compartment.

- Include catwalk floor in model.

  A further assesment is necessary to determine whether the model should be augmented with porous faces representing the floor of catwalks. There is one long grated walkway in the space behind each AHPC compartment. The actual flow blockage from these catwalks is most likely fairly modest, but they are placed in potentially critical spots and their presence may have localized effects in the corners of filter compartments.

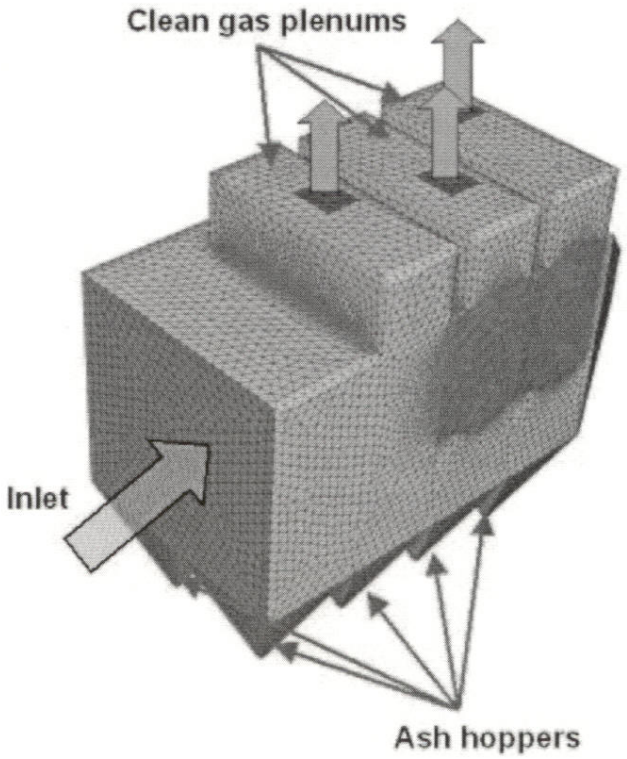


Figure 3: Computational mesh from existing CFD model.

The Elex CFD model used a mesh discretization with approximately 1.5 million computational cells, see Figure 3. Approximately 2/3 of these cells were used to describe the three AHPC compartments. The computer resources available to Elex made it infeasible to further increase mesh resolution, although it remained relatively coarse inside the compartments.[5] For the proposed work, use of parallel processing on the extensive computing clusters at NETL in Morgantown will enable an expansion of the model size by a factor of 2-3. Our preliminary investigations indicate that this would be sufficient to resolve the actual geometry of the individual filter bags, but it is our recommendation not to do so but rather to maintain the porous box approach with a finer mesh. The filter bag geometry will be considered in the proposed Task 3.

In contrast to the Elex mesh that consisted of 100% tetrahedral cells, we will be employing hexahedral meshing in as far as possible. Because of the spatial interpolation schemes involved in CFD this will achieve a higher solution accuracy. Moreover, a hexahedral mesh typically has significantly lower cell count than a comparable tetrahedral one.

1.1.2 Boundary conditions

Current theories on gas flow patterns inside a hybrid filter chamber, see Figure 1, were developed based on Pitôt tube data collected inside a chamber at the Big Stone power plant. These measurements, which may be correlated to the flue gas dust loading, were performed at three locations in each AHPC compartment: front, middle, and back. It is our intent to incorporate this measured data by implementing variations in the Δp characteristics (porous jump conditions) that model the pressure drop over filter bags.

All boundary conditions will be re-visited in cooperation with the power plant and technology developers to ensure consistency with the real operating conditions at Big Stone. In comparison with the Elex CFD model, the following changes in the handling of porous jump faces will be implemented.

- Lengthwise splitting of porous jump faces

  Each of the large porous faces that separate the ESP zones from the filter bag zones will be sub-divided into three zones. Since a variation in Δp over one porous jump face cannot be assigned in Fluent, this sub-division is necessary to allow for variation. The resulting three zones may subsequently be assigned individual jump conditions based on the abovementioned Pitôt data from the front, middle, and back of that compartment. Other subdivisions are possible, but only make sense whenever matched by data.

- Define porous bottom of filter bag zones

  Change the bottom of filter sections from a solid to a porous face. Notice the conditions for this face must also contain the (dominant) pressure drop across the fabric filters.

- Catwalk floor porosity

  If it is chosen to include the grated walkways in the CFD model, empirical expressions for the induced pressure drop must be taken from literature and implemented.

[5] The ESP sections were described using only one cell across the width, while two cells were used inside the porous box that represents a row of bags.

1.1.3 Simulations

We propose to initially perform two different simulations: *(a)* with a uniform pressure drop across all filter bag sections (this corresponds to the Elex model with geometric modifications only), and *(b)* with a variation in pressure drop that reflects the measured data better. A comparison between these two simulations will reveal how sensitive the overall flow distribution is to perturbations in the prescribed pressure drop conditions. The filter membranes are by far the biggest source of frictional resistance in the entire unit, so logically one would expect these particular boundary conditions to have a significant impact on the distribution of flue gas flow.

After completing these initial CFD simulations, a comparison will be made between predicted and measured flow rates through the individual clean gas plenums. If the split of flow between compartments is predicted with reasonable accuracy, this helps build confidence in the simulations. Another option for model validation is to do additional velocity measurements, preferably by traversing the chamber-width at a position below or in between hybrid compartments. The recorded velocity profile may then be compared with simulation results.

A third simulation *(c)* will investigate the importance of the inlet velocity profile. In this simulation, an artificially skewed velocity profile will be assigned at the model inlet. This is in contrast to the uniform inlet profile applied in cases *(a)* and *(b)*. Quite possibly the narrowly spaced collecting plates of the old ESP field may annul this perturbation in inlet velocities. However, should a significant change in flow distribution result there is reason to consider building a separate CFD model that considers the flow manifolding from the air preheater to the four AHPC chambers. [6]

1.1.4 Post-processing

Postprocessing of simulation data will produce a collection of plots that describe the chamber flow pattern. Moreover, the directional partitioning of flow *into* each AHPC compartment (from the front, back , and bottom respectively) will be quantified. This data will help confirm or modify the current hypothesis on flow distribution, which will briefly be outlined under Task 2. Due to the geometric simplifications in representing the filter bag rows, care should be exhibited in interpreting flow patterns *within* the AHPC compartments. The detailed model, proposed as Task 3 of this effort, will provide a much better basis for such interpretations.

[6] Incidentally, such a study might help explain some of the variation that exists between the performance of the four parallel filter chambers. It is currently thought that this variation results from variations in chamber temperatures that impact the ESP performance.

1.2 Estimated work effort for Task 1

Table 1 gives an estimate of the work hours involved in Task 1. Sub-tasks correspond more or less to the previous sections.

TASK 1 : Modeling of *existing* unit

Sub-task	Task description	Work effort [h]	Comments
1.1	Geometric modeling and meshing	80	
1.2	Boundary condition setup	40	
1.3	Simulations	90	Simulations *(a)*,*(b)*, and *(c)*
1.4	Post-processing	30	
TOTAL		240 h	

Table 1: Estimated man-hours for carrying out the proposed Task 1

TASK 2: Simulation of design modifications

This task will determine the effect of two simple design modifications that both aim at improving the flow patterns in the Big Stone AHPC. Based on the already mentioned Pitôt tube measurements, the AHPC technology developers have formed a theory on the gas flow dynamics of this unit, see Figure 1. For the first AHPC compartment, it is believed that gas enters mostly from the front and flows towards the back while gradually effusing via the collecting plate perforations. In the two rear compartments, flow seems to enter the ESP zones from multiple directions (front, back, and bottom). The flow simulations of the existing unit will help confirm or refine this understanding, so that it is advisable to revisit the suggested design modifications after completion of the Task 1.

2.1 Suggested design modifications

As mentioned earlier, electrostatic precipitation will generally benefit from a uni-directional gas flow in the electro magnetic field between the collecting plates. For this reason, design modifications should first and foremost attempt to alter flow in the two rear compartments, where cross- and counter-flow is believed to be most prevalent. After consulting with the AHPC developers, it is proposed to investigate the following two design modifications:

A Installation of steel plates on the end of all AHPC compartments

The gas flow in this configuration can enter the ESP zone from the front or bottom of fields. This measure reduces the possible routes that the gas may travel. A simulation will reveal whether this results in a more uniform gas distribution or not.

B Installation of steel plates on both ends of the two rear AHPC compartments

In this configuration the first AHPC field remains unchanged, while gas flow can only enter the rear fields from the bottom. This should ensure similar pat-

terns in the two affected fields, but may increase problems with gas sneakage and may also cause significant lengthwise variations in the loading of the individual bags.

These two design modifications may have to be implemented in conjunction with a deflector system to limit gas sneakage from the bottom. This will be addressed by the detailed study of a compartment in Task 3. From a CFD perspective, the abovementioned design changes can be easily implemented in the model from Task 1; accomplished by a change in boundary conditions rather than geometry. In both cases it is also possible to investigate the use of perforated rather than solid plates. For both design studies, we will determine the directional re-partitioning of flow and also report any regions of high velocity or turbulence intensity.

2.2 Estimated work effort for Task 2

As this Task makes use of the CFD model developed under Task 1, a faster turn-around time can be expected for this second task. Estimates are given in Table 2.

TASK 2 : Modeling of *modified* unit

Sub-task	Task description	Work effort [h]	Comments
2.1	Model modification	25	Design studies **A** and **B**
2.2	Simulations	60	
2.3	Post-processing	20	
TOTAL		105 h	

Table 2: Estimated man-hours for carrying out the proposed Task 2

TASK 3: Detailed Modeling of Filter Compartment

With this task it is proposed to build a separate CFD model, which consider a portion of a filter compartment with a more refined geometry representation. This model is intended to predict flow details that cannot reasonably be described by the overall CFD model (Task 1). Most importantly, it will shed light on the sneakage ratio, i.e. the fraction of flow that bypasses the ESP section and instead enters the filter bag sections vertically. The model can also be used to assess deflector arrangements to reduce sneakage.

3.1 Modeling approach

The model will comprise a layer-wise arrangement of three full bag rows and four ESP zones, see Figure 4. Symmetry boundary conditions will be prescribed at the two model boundaries that cut through the center of an ESP zone. This configuration emulates a sub-domain inside a larger compartment, where the inclusion of several bag rows aims at limiting boundary effects. Flow will exit the model via an artificially defined plenum that receives gas from the bags.

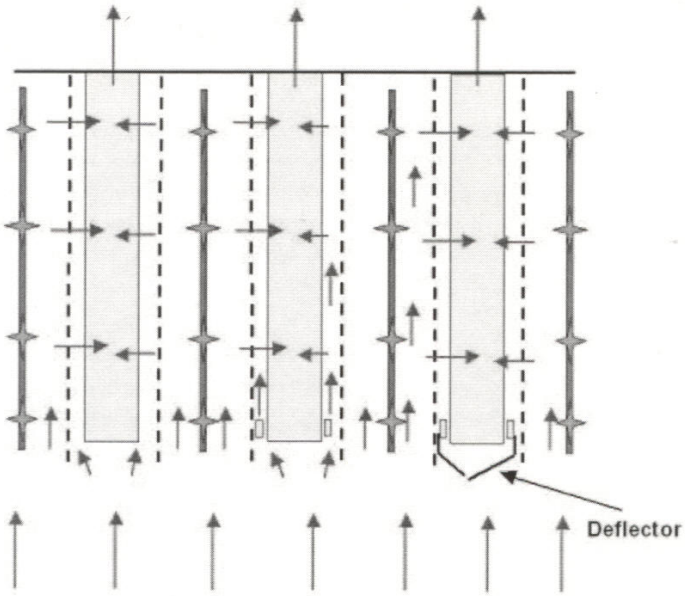


Figure 4: Detailed model of hybrid compartment. Shown discharge electrodes not modeled.

The inlet flow condition will be prescribed in terms of a uniform velocity from the bottom, which may be either vertical or at an angle. The exact velocity magnitude and direction will be estimated based on the flow simulations for the overall chamber (Task 1 and 2). Variations in the approaching flow will exist depending on what part of a compartment you consider. The sensitivity in modeling results can be assessed by computing the sneakage ratio for a series of detailed model simulations with changes in the inlet velocity direction and/or magnitude.

The perforated collecting plates and the individual bags (3×21 in the model) will be modeled using different porous jump conditions, see section 1.1. The flow resistance of the perforated plates will be derived from an empirical relation, and should be significantly lower than the flow resistance of the bags.

3.2 Design studies

The second part of Task 3 will be a design study, considering the impact of equipping bag rows with a deflector arrangement to limit gas sneakage. An example of such a bag deflector can be seen for the right bag row in Figure 4. The exact deflector design will be provided later by the AHPC technology developers. Simulations will be performed for the same set of inlet conditions that was used in subtask 3.1. While it will be difficult to experimentally verify the predicted sneakage ratios, it is believed that the outlined CFD models (with and without deflectors) will predict trends with confidence.

3.3 Estimated work effort for Task 3

TASK 3 : Detailed Flow Simulation

Sub-task	Task description	Work effort [h]	Comments
3.1	Geometric modeling and meshing	60	From scratch
3.2	Boundary condition setup	20	
3.3	Simulations	50	Varying inlet conditions
3.4	Post-processing	20	
3.5	Design variation studies	60	Bottom deflector plate
TOTAL		210 h	

Table 3: Estimated man-hours for carrying out the proposed Task 3

4 Deliverables and Schedule

A strategy for the deployment of CFD modeling to assist in trouble-shooting of the AHPC unit at Big Stone power plant has been outlined. This section will summarize deliverables, estimated work effort, and present a time schedule for completion of the proposed tasks.

4.1 Project Deliverables

Project progress will be reported on a monthly basis in a short written status report. After successful completion of the project, `Fluent Inc.` will deliver the following items:

- Report summarizing CFD results from modeling of overall chamber flow (Tasks 1+2).
- Report summarizing results from detailed modeling of a filter compartment (Task 3).
- Fluent case/data files for all completed simulations.

4.2 Project time schedule

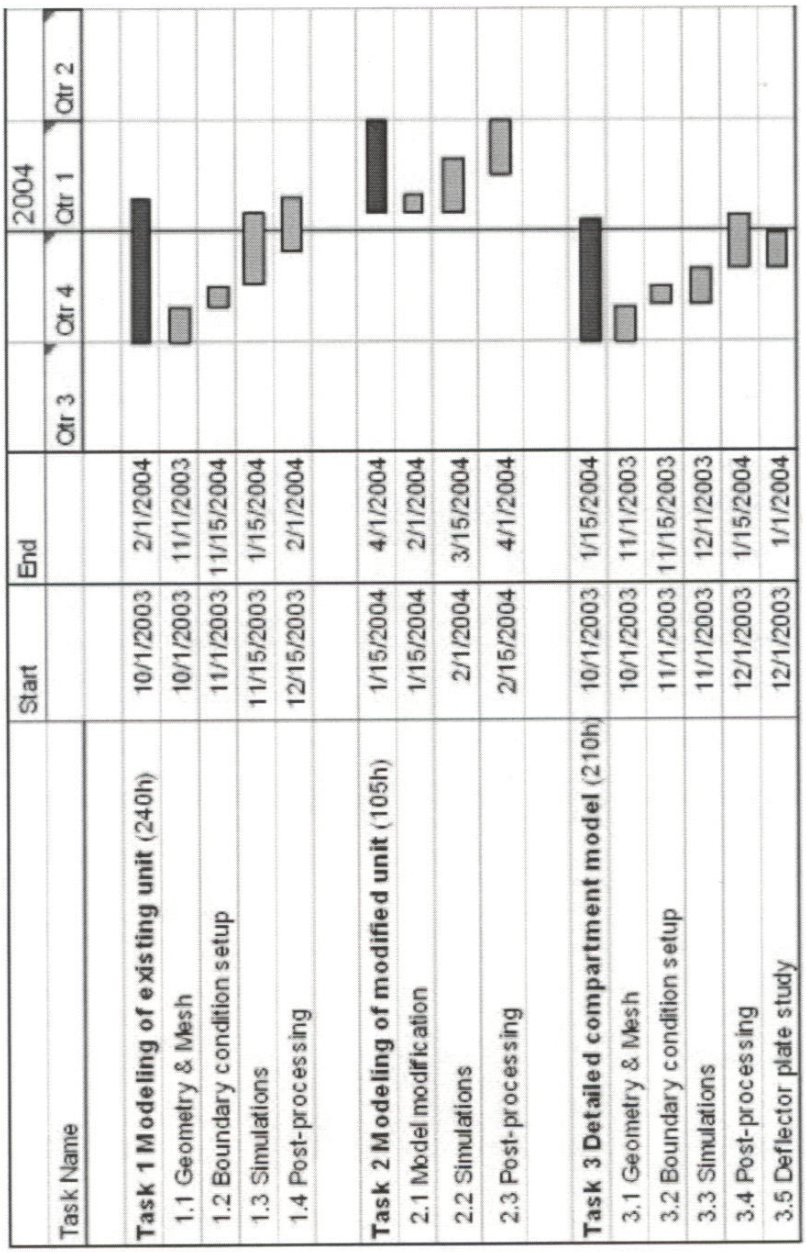
The specific breakdown into tasks and an estimate of the engineering hours have been compiled in Table 4.

Task	Task description	Work effort [h]
1	Modeling of overall flow distribution in the *existing* unit	240
2	Modeling of overall flow distribution in the *modified* unit	105
3	Detailed modeling of simplified filter compartment	210
TOTAL		555 h

Table 4: Summary of estimated man-hours for all tasks

Figure 5 shows the time schedule for completion of the specific subtasks. This chart has been based on work commencing October 1^{st} 2003. As it appears, the total elapsed time

to complete the project is expected to be six months. While Tasks 1 and 2 are essentially sequential activities, the schedule for completion has been accelerated by working on Tasks 1 and 3 in parallel.



Task Name	Start	End
Task 1 Modeling of existing unit (240h)	10/1/2003	2/1/2004
1.1 Geometry & Mesh	10/1/2003	11/1/2003
1.2 Boundary condition setup	11/1/2003	11/15/2004
1.3 Simulations	11/15/2003	1/15/2004
1.4 Post-processing	12/15/2003	2/1/2004
Task 2 Modeling of modified unit (105h)	1/15/2004	4/1/2004
2.1 Model modification	1/15/2004	2/1/2004
2.2 Simulations	2/1/2004	3/15/2004
2.3 Post-processing	2/15/2004	4/1/2004
Task 3 Detailed compartment model (210h)	10/1/2003	1/15/2004
3.1 Geometry & Mesh	10/1/2003	11/1/2003
3.2 Boundary condition setup	11/1/2003	11/15/2003
3.3 Simulations	11/1/2003	12/1/2003
3.4 Post-processing	12/1/2003	1/15/2004
3.5 Deflector plate study	12/1/2003	1/1/2004

Figure 5: Projected timeline for completion of proposed tasks.

B34 Proposal for flow Baffles

Advanced Hybrid ™ Filter

Proposed Filter Bag Bottom Flow Restriction
Baffle Design

To:

John Caine SEI

Ulrich Leibacher ELEX

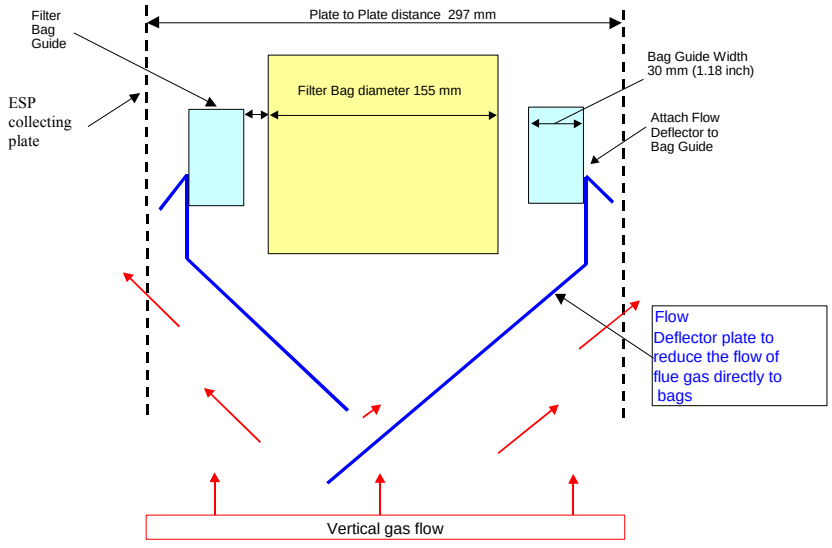
Peter Studer ELEX

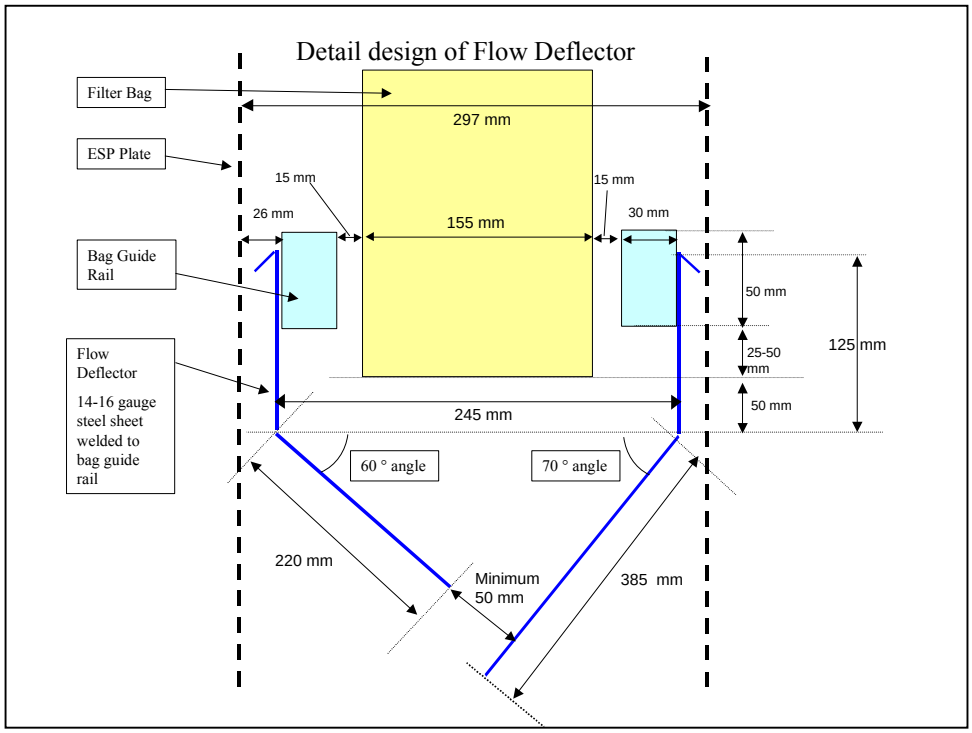
From:

Rich Gebert W.L. Gore

September 30, 2003

Expanded end view of the bottom of the filter bag and the proposed flow deflector





Dimensions

- The drawings and information contained in this proposal are to be used as a guide for the design of the flow deflector plates.
- The bag guides or rectangular tubing dimensions based on the ELEX drawings are: 30 mm wide by 50 mm high by 4570 mm in length and are placed 15 mm from the bags and 26 mm from the collecting plates.
- The bag diameter is 155 mm and they are spaced 200 mm on center down the row with 21 bags per row creating a 4.2 meter length of bags.
- The proposed steel sheet deflector plates are designed to reduce the amount of gas flow that passes between the filter bags in the bag row and between the ESP collecting plates.
- The steel sheet 14 - 16 gauge can be spot welded, stick or mig welded to the bag guide rail.
- The downward angle is 60-70 degrees to allow the collected dust to fall into the hopper and the minimum clearance between the two plates must be 50 mm.
- Plate #1 at 60 degrees comprises 125mm of vertical section and a 220mm length at 60 degrees. The overall area is 1.4 sqmeter (51 sqft).
- Plate #2 at 70 degrees has 125 mm vertical section and 385 mm of sheet at 70 degrees at length of 4.2 meters. The overall area is 2.14 m2 (75 sqft).
- The area and weight of these plates for 16 gauge steel is 127 lbs and 187 lbs which may be in excess for the structural design limits.

B35 Photograph of Bag wash of original bags in Big Stone turbine bay

B36 Photograph of bag row baffles prior to installation on Advanced Hybrid walkway

B37 W.L. Gore Report on Bag Analysis

Full scale *Advanced Hybrid*™ Filter Big Stone Demonstration Operation Site Filter Bag Analysis

Date: September 4, 2003
Prepared By: Dwight Davis and Rich Gebert

Background:

Plant Location: Otter Tail Power Company, Big Stone City, South Dakota
Filter Bag Type: GORE-NO STAT® filter bags (GORE-TEX® membrane conductive/GORE-TEX® felt)
Bag Diameter: 6.0 inch
Length: 7 meter
Air/Cloth: 10 to 12 fpm
Dust Type: Fly Ash from Coal-Fired Boiler
Coal Type: Eagle Butte, Belle Ayr Mine; Western Sub-bituminous

GORE-NO STAT® filter bags were installed and pre-coated prior to the October 25, 2002 start-up of the full scale *Advanced Hybrid*™ Filter at Otter Tail Power Company's Big Stone Plant located in Big Stone City, SD. The unit remained in operation until the Big Stone Plant shutdown for a boiler wash on February 26, 2003. Operation resumed on March 2, 2003, with five conductive GORE-TEX® membrane on conductive polyphenylene sulfide (PPS) felt filter bags installed in Compartment 12. The PPS bags replaced the original filter bags in cross row 21, positions 1,4,6,7 & 10 (see bag locator chart in the appendix). During the February boiler wash 40 pitot tubes were also installed in compartments 7,8,9,10,11,and 12 for measuring air flow from individual filter bags. On April 26th and May 8th, chambers 2B and 1A respectively, filter bags were washed in place by Big Stone plant personnel while the Big Stone Plant operated at reduced load. The second boiler wash with a bag change out occurred on June 2, 2003.

As part of the Power Plant Improvement Initiative Big Stone Demonstration site DOE funding program, filter bags were removed for lab analysis when compartments or the entire Advanced Hybrid™ Filter were taken off line. Filter bag/s were removed November 9th after 2 weeks of operation, February 28th after 18 weeks of operation, April 12th after the PPS bags experienced 6 weeks of operation, and June 2nd after the PPS bags experienced 3 months of operation.

Filter Bag Evaluation:

A total of seven filter bags were removed over the eight month time period by W.L. Gore and Associates personnel for evaluation purposes. Various tests including; air permeability, felt strength, residual dust cake particle size and elemental analysis, along with visual observations including membrane microscopic

examination were undertaken.

Air Permeability Analysis

The air permeability analysis of the filter bag media was performed in the lab using the Frazierometer. Permeability is the volumetric flow rate of air, measured in cubic feet per minute (cfm) through a square foot of filter media at a pressure differential of 0.5 inches water gauge (w.g.). The unit of measure is cfm/ft2 @ 0.5"w.g. and is called the Frazier Number (Fn). Samples of the *Advanced Hybrid*® filter bag media were cut from the top, middle, and bottom bag locations. The sample size was five inches in the vertical bag length direction along the entire circumference of the bag. Typically three measurements per bag sample were taken. An average value is then calculated from the nine measurements per bag. . Each sample is tested for permeability in the condition it was received from the field and again in the identical location after lightly brushing the dust cake. See Table 1:

Otter Tail Power Company							
Big Stone Power Plant Improvement Initiative Demonstration Site							
Filter Bag analysis summary chart - All Frazier #'s are reported as cfm/ft2@ 0.5 in.w.g. driving force							
Date installed	**Date removed**	**installed time**	**Laminate backing**	**As rec'd (Fn)**	**After light brushing (Fn)**	**Flat width ave.(cm)**	**Mullen Burst (psi)**
10/25/2002	11/9/2002	2 wks.	GORE-TEX felt	2.1	4.2		
10/25/2002	3/1/2003	18	GORE-TEX felt	2	4.6		701
10/25/2002	3/1/2003	18	GORE-TEX felt	1.5	4.3		724
3/1/2003	4/12/2003	6	PPS felt	1.4	6.6	24.9	323
3/1/2003	6/2/2003	13	PPS felt	1.8	5.5	24.9	372
3/1/2003	6/2/2003	13	PPS felt	1.7	5	24.9	374
10/25/2002	6/4/2003	32	GORE-TEX felt			24.6	742

Table 1. Test Results Summary Chart

All the filter bags when removed contained a thin layer of dust similar to typical coal fired boiler fabric filter particulate collector applications. This residual filter cake and filter bag media air permeability measurement is shown in the " as received Frazier numbers" column. As the filter bags seasoned, whether the bags consisted of the conductive GORE-TEX felt or conductive PPS felt backing, the differences in the overall permeability of the two types of filter bags narrowed. After light brushing, all the filter bag perms returned to near new levels. It should be noted that when brushing the bags removed March 1st, extra effort was required to remove all the dust off the surface of the bag.

Felt Strength

Mullen burst tests were run on a portion of samples taken for the air permeability measurements. The test consists of applying pressure in the reverse direction of airflow on a three inch diameter filter bag sample, continuously increasing the pressure until the sample is ruptured. The physical strength of new GORE-TEX® felt backed filter bags averaged 650 psi while the PPS felt filter bags averaged 344 psi. As shown with the Mullen Burst test results, both types of filter bags' physical strength has not been weakened due to chemical or thermal attack of the flue gas environment inside the *Advanced Hybrid*™ Filter to date.

Visual and Microscope Analysis

As noted earlier, all the filter bags contained a thin layer of dust cake on the membrane surface, typical of most coal -fired boiler applications. The primary dust cake was easily brushed off the November sampled filter bag and the PPS bags removed in April and June, but required more effort on the bags removed in February. The filter bags were examined for membrane damage from electrostatic discharge or sparking using a microscope - no damage was observed. However, by the February inspection inside the *Advanced Hybrid*™ Filter chambers, a portion of the filter bags exhibited wear in two general areas. One located at the center of the bottom disk of the bag, and the second area where the bag occasionally comes into contact with the bottom bag guide rails. The design of the filter bag took into account the expected wear at the bag guide rails incorporating a double layer of material in the bottom cuff.

Samples were taken from two of the filter bags for SEMS and an EDS analysis of the dust layer from the two filter bags removed in February. The results can be found in the APPENDIX. The SEMS indicate the residual flyash dust cake particle size falls in the range of 0.5 to 10 microns. Results from the EDS analyses indicate Potassium's presence in the flyash along with the other expected elements.

A single wrinkle formed on each of the PPS bags indicates some stretching occurred during the operation of the Advanced Hybrid™ Filter. The flat width measurements of these bags reaffirmed the visual observation showing the bags circumference increased roughly 0.9 cm.

.

Conclusions:

- Visual analysis of filter bags revealed excellent membrane integrity.

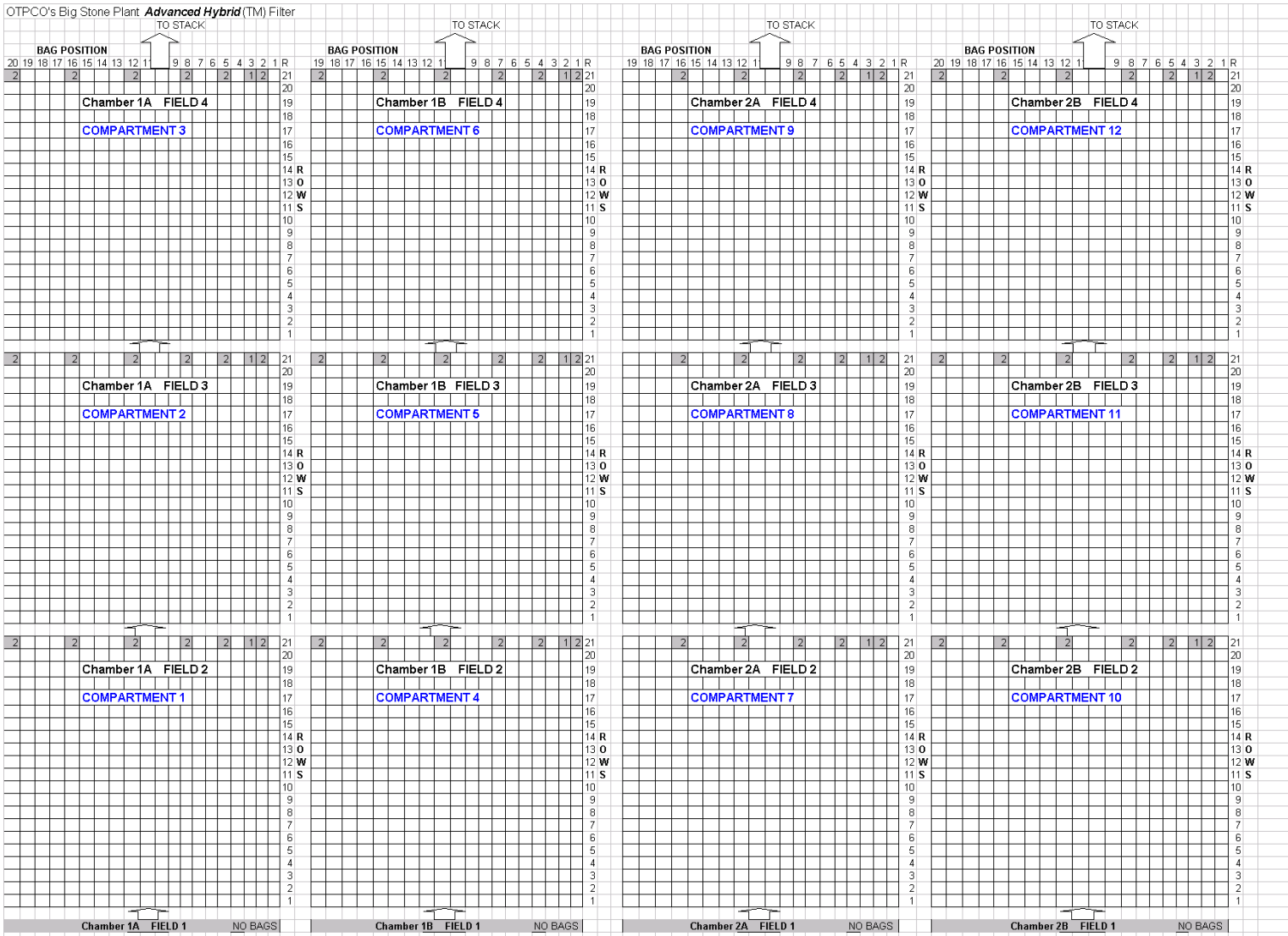
- Laboratory analysis of the filter bags revealed no membrane damage caused by electrostatic discharge or sparking.

- After 32 weeks of service the GORE-NO STAT® filter bags exhibited no loss in physical strength and the permeability looked good.

- After 13 weeks of service the PPS backed GORE-TEX® membrane filter bags also showed no loss in strength and retained their permeability.

- Future PPS bag manufacturing will incorporate a design change to reduce/eliminate the bag circumference growth.

APPENDIX
Bag Locator Chart



Number Designations

1	6/1/2002	Bags eliminated due to Rapper Pinwheel Assembly in the way
2	10/12/2002	Bags eliminated due to Rapper Shaft bearing supports in the way

SEMS Photo

Surface comparison of 777013-Dust Cake and 777023-Dust Cake:

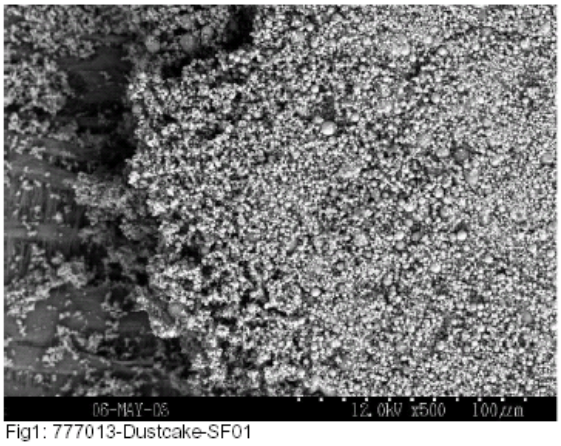


Fig1: 777013-Dustcake-SF01

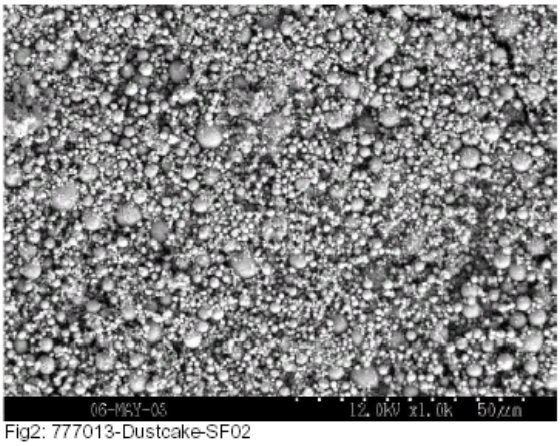


Fig2: 777013-Dustcake-SF02

Fig3: 777023-Dustcake-SF01

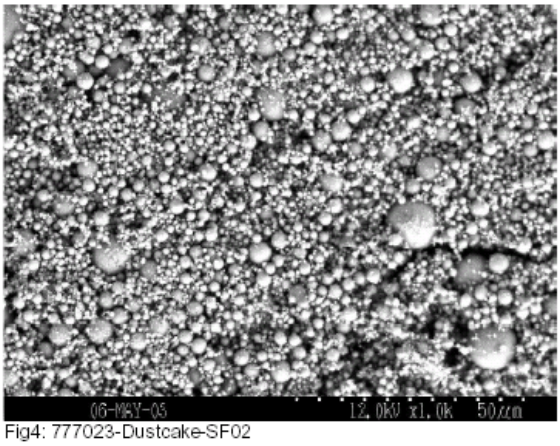


Fig4: 777023-Dustcake-SF02

EDS results

Elemental comparison of 777013-Dust Cake and 777023-Dust Cake:

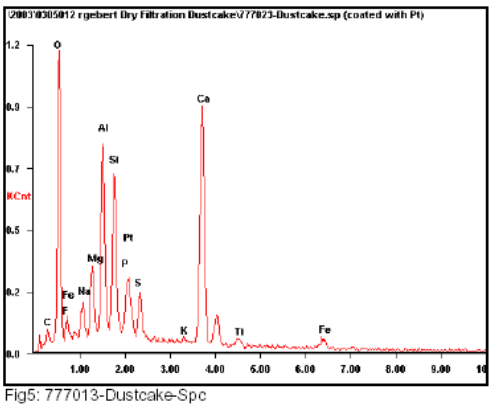


Fig5: 777013-Dustcake-Spc

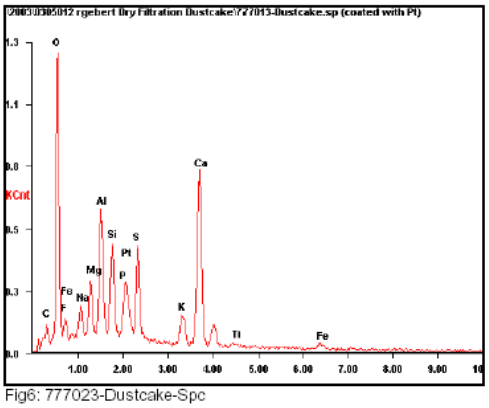
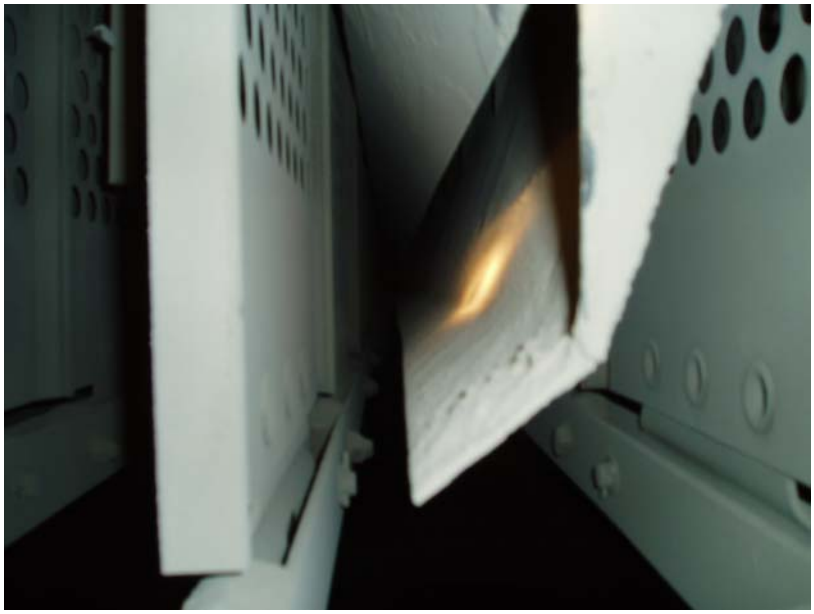


Fig6: 777023-Dustcake-Spc

B38 Photographs of baffles in place



View of exterior of flow baffles

View of interior of flow baffles

Advanced Hybrid Outage Report
June 4, 2004 – June 12, 2004

Prepared By:

Tom Hrdlicka
Plant Engineer

June 14, 2004

Summary of Work

1) Bag inspection
2) Bag replacement
3) Installed bag row baffles
4) Modified blowpipes
5) Moved pitot tubes to new locations and checked for proper orientation
6) Repair girder box and bus duct purge air supply line
7) Complete inspection of:
    a. Clean gas plenums (leaks, cracks, corrosion, ash on tubesheet, etc.)
    b. Discharge electrodes and plates for clearance issues and ash build-up
    c. Rapper shafts, pinwheels, hammers and anvils
    d. Girder boxes for leaks and insulator crock condition

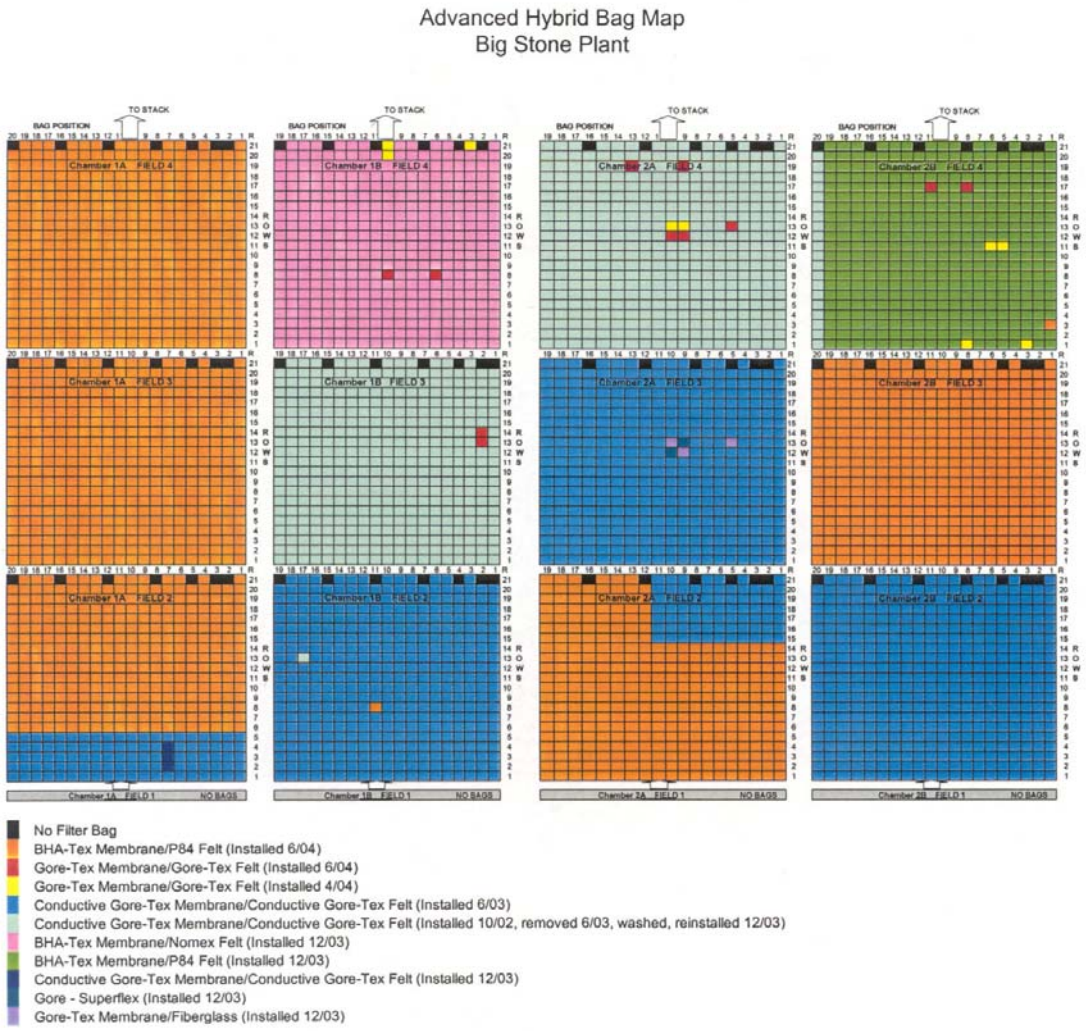
Results and Discussion

1) Bag Inspection

    a. Expectedly found holes in many nonconductive PPS/Gore-Tex bags in 1AF3 and 1AF4 as well as a few holes in the conductive PPS/Gore-Tex bags in 1AF2, 2AF2 and 2BF3. All the bags in these compartments have been in service for one year and were scheduled to be replaced during this outage.
    b. Found two all Gore-Tex bags with holes in the bottom of the bag, one was installed new in June 2003 (1BF2) and the other was an original bag that was washed and reinstalled in Dec 2003 (1BF3).
    c. One Nomex bag was found with a hole in 1BF4.
    d. The following bags were pulled to be sent in for analysis:
        i. 2 BHA-Tex/Nomex (one with a hole in it)
        ii. 1 Gore-Tex/Gore-Tex
        iii. 1 Gore-Tex/Fiberglass (installed with a 24 vertical wire cage)
        iv. 1 Gore-Tex/Fiberglass (installed with a standard 16 vertical wire cage)
        v. 1 Gore-Tex/Superflex
        vi. 2 BHA-Tex/P84
        vii. Two new BHA-Tex/P84 bags will also be sent in for analysis
        viii. ECC will perform the bag analysis and issue a report in mid July.
    e. Ten missing nozzles were also discovered and new nozzles were installed.

2) Bag Replacement

    a. SEI was contracted to replace 1928 filter bags. The replacement bags, provided by BHA Group, Inc., are 14 oz. P84 felt with a BHA-Tex membrane. SEI also replaced 13 additional bags using new Gore-Tex felt with Gore-Tex membrane bags (see updated bag layout below).
    b. The blowpipes came apart relatively easy and there were no extra charges incurred during this bag change due to difficult bag or cage removal.



3) Installed Bag Row Baffles (see Figure1-3 below)

   a. SEI was contracted to fabricate and install 57 sets of bag row baffles. The baffles were installed in all compartments of chamber 2B.
      i. Half of the baffles had to be modified because of incorrect fabrication.
      ii. Once the modifications were made, all three compartments were installed in only two days.
      iii. The decision was made to tack weld the nuts on to support bracket bolts and also to tack weld the ends of the baffles near the bottom to maintain a 2-inch gap.
      iv. There is some concern surrounding the clearance between the bag and the cut out portion of the end baffles.

Figure 1: Installed baffles viewed from below.

Figure 2: End baffle without tack weld

Figure 3: End baffle with tack weld

4) Modified Blowpipe

a. One compartment of blowpipes was modified in 1BF3 (see Figure 4)
b. Flat bar was used to seal off the holes for the top header (see Figure 5)

Figure 4: Modified blowpipes in 1BF3

Figure 5: Flat bar used to cover holes in plenum wall

5) Pitot Tubes

   a. Pitots were repositioned in 1BF3 to monitor the modified blowpipes and 2BF3 to help determine the effectiveness of the baffles.

6) Repair Purge Air Supply Lines

   a. SEI repaired four girder box and bus duct purge air supply lines. The PVC lines installed in Oct. 2002 were warped due to heat. Metal ducting was installed (see Figures 6-7).

Figure 6. New girder box purge line

Figure 7: Purge line interface to girder box

7) Complete Inspection

   a. Discharge electrodes and plates
      i. Discharge electrodes have a thin layer of ash that is uniformly distributed. The ash brushes off with a soft bristle brush.
      ii. The plates also had a thin layer of ash that is uniformly distributed. No buildup near the top of the plates was observed and no holes were plugged.
      iii. No obvious clearance issues were reported.
   b. Rappers
      i. The majority (95%) of the hammers are striking the anvils on center with the remainder within 1 cm.
      ii. No broken hammers or rapper components were reported.
   c. Girder Boxes

i. No ash buildup in the girder boxes.
ii. No cracked insulator crocs reported.

d. Clean Gas Plenums
   i. Amount of corrosion on ceilings has increased from last inspection (see Figure 8). Noted water dripping in around one top hatch (see Figure 9).

Figure 8. Corrosion on plenum ceiling

Figure 9. Plenum top hatch corrosion

Recommendations

- 10 filter bags will be sent in to ECC for analysis including 2 new P84 bags. The new bags will provide some baseline strength data that we do not have to date. Results will be available mid July.

- Standing water that is getting under the roof lagging is causing the corrosion. This problem needs further investigation to develop a solution.

- Pitots have been installed to monitor the modified blowpipes and chamber of baffles. They will have to be rotated on a regular basis to obtain data from different bags.

- The bags near the end baffles will have to be monitored closely. There is potential for abrasive wear and tearing for the bags in these positions.

B40 W.L. Gore and Associates Bag Report

Full scale *Advanced Hybrid*™ Filter Big Stone Demonstration Operation Site Filter Bag Analysis

Date: June 11, 2004
Prepared By: Dwight Davis

Background:

Plant Location:	Otter Tail Power Company, Big Stone City, South Dakota
Filter Bag Type:	GORE-NO STAT® (GORE-TEX® membrane conductive/GORE-TEX® felt), GORE-TEX® membrane/PPS (polyphenylene sulfide) felt, GORE-TEX®membrane/conductive PPS felt, SUPERFLEX®, GORE-TEX®membrane/woven fiberglass filter bags, NOMEX® and P-84 backed filter bags
Bag Diameter:	6.0 inch
Length:	7 meter
Air/Cloth:	10 to 12 fpm
Dust Type:	Fly Ash from Coal-Fired Boiler
Coal Type:	Eagle Butte, Belle Ayr Mine; Western Sub-bituminous

GORE-NO STAT® , GORE-TEX® membrane/PPS felt, GORE-TEX® membrane/conductive PPS felt, SUPERFLEX®, GORE-TEX®membrane/woven fiberglass filter bags were installed and pre-coated prior to the June 11, 2003 start-up of the full scale *Advanced Hybrid*™ Filter at Otter Tail Power Company's Big Stone Plant located in Big Stone City, SD. Refer to the June 11, 2003 bag locator guide found in the appendix. On July 14, 2003 a portion of the filter bags were exposed to a temperature excursion that exceeded their maximum temperature rating. Subsequently Big Stone took a derate to inspect and pull filter bags for analysis in two chambers on September 17th, and a third chamber on September 27th. On October 24th additional bags were pulled from three chambers for analysis. Big Stone remained in operation until the plant shutdown for a boiler wash on December 5, 2003. Operation resumed on December 20, 2003, with new bags replacing the all PPS filter bags in four of the compartments along with four trial SUPERFLEX® and six trial GORE-TEX® membrane/woven fiberglass filter bags. The filter bags pulled September 17th & 27th and October 24th for analysis, indicated the all PPS filter bags had been weakened in four of the compartments. This led to the four compartments' filter bags replacement during the December 2003 boiler wash shutdown. Two of the compartments were outfitted with previously used (Oct '02 to June '03) and washed off-line GORE-NO STAT® bags, the third compartment was outfitted with NOMEX membrane bags and the other with P-84 membrane bags. Refer to the December 2003 bag locator chart in the appendix for the replacement and trial filter bag location. On February 28th, 2004 the plant scheduled one last inspection and bag sampling derate prior to their June

2004 boiler wash outage.

As part of the Power Plant Improvement Initiative Big Stone Demonstration site DOE funding program, filter bags were removed for lab analysis when compartments or the entire *Advanced Hybrid*™ Filter were taken off line. Ten filter bags were removed on September 17th, one on September 27th, five on October 24th, and five additional filter bags on February 28th, , 2004.

Filter Bag Evaluation:

A total of twenty-one filter bags were removed over the nine month time period by W.L. Gore and Otter Tail Power Company personnel for evaluation purposes by W.L. Gore and Associates. Various tests including air permeability, felt strength using both Mullen Burst and Instron tensile strength tests, along with visual observations including membrane microscopic examination were undertaken.

Air Permeability Analysis

The air permeability analysis of the filter bag media was performed in the lab using the Frazierometer.

Permeability is the volumetric flow rate of air, measured in cubic feet per minute (cfm) through a square foot of filter media at a pressure differential of 0.5 inches water gauge (w.g.). The unit of measure is cfm/ft2 @ 0.5"w.g. and is called the Frazier Number (Fn). Samples of the *Advanced Hybrid*® filter bag media were cut from the top, middle, and bottom bag locations. The sample size was five inches in the vertical bag length direction along the entire circumference of the bag. Typically three measurements per bag sample were taken. An average value is then calculated from the nine measurements per bag.

Each sample is tested for permeability in the condition it was received from the field and again in the identical location after lightly brushing the dust cake. See Table 1:

Otter Tail Power Company
Big Stone Power Plant Improvement Initiative Demonstration Site
Filter Bag analysis summary chart - All Frazier #'s are reported as cfm/ft2@0.5 in.w.g. driving force

Location	Service Time	Max. exposed temp (F)	Backing	As rec'd (F-n)	Mullen Burst (psi)	Mullen Burst % Strength Retention	Tensile strength - cross machine direction (psi)	%Tensile strength retention - cmd	Tensile strength - machine direction (psi)	% Tensile strength retention - md	Comments
1BF3 R1B1	6/10/03 to 9/17/03	365	all PPS	2.9	249	72	113	39	83	61	membrane OK, tan felt color
1BF3 R1B3	"	365	all PPS	3.6	226	66					membrane cracking along some of the vertical cage wires
1BF3R1B4	"	365	all PPS	4	223	65					membrane cracking at vertical/horizontal cage wire junctures
1BF3 R1B6	"	365	all PPS	3.8	182	53			51	37	membrane delaminated during HEC cleaning
1BF3R1B7	"	365	all PPS	2.7	236	69	114	39	61	45	membrane cracking, tan felt color
2BF2 R3B5	"	500	all GT	1.9	717	100					membrane OK
2BF2 R3B8	"	500	all GT	1.5	735	100					membrane OK
2BF3 R19B6	"	500	cond PPS	2.3	481	96	181	54	243	100	membrane OK, chocalat brown felt color
2BF3 R19B7	"	500	cond PPS	2.2	473	94	180	54	200	83	bag turned inside out during removal
2BF4 R20B7	"	500	all PPS	2.8	208	60	90	31	73	53	membrane scraped during removal, dark tan felt color
1AF4 R11B11	6/10/03 to 9/27/03	322	all PPS	3.9	234	68	123	43	90	66	membrane cracking along vertical and horizontal cage wires
1AF4 R1B20	6/10/03 to 10/24/03	322	all PPS	3.6	368	78	104	36	42	31	membrane cracking in vertical direction between vertical cage wires
1AF4 R1B12	"	322	all PPS	4	229	67	73	25	24	17	membrane cracking at vertical/horizontal cage wire junctures, tan felt color
1BF3 R21B5	"	365	all PPS	6.9	203	59	48	16	10	8	holes formed through felt backer, choc. brown felt
1BF3 R21B6	"	365	all PPS	5	210	61	33	11	2	2	membrane delamination, holes in felt
2AF4 R21B14	"	450	cond PPS	2	463	92	115	34	197	82	tan discoloration, hole in felt
1AF2 R15B11	6/10/03 to 2/28/04	322	cond PPS	2.6	449	89	224	67	205	85	membrane OK
1AF3 R11B15	"	322	all PPS	3	214	59	125	43	78	57	holes formed at vertical/horizontal cage wire junctures
2AF4 R13B10	12/3/03 to 2/28/04	350	SUPERFLEX	3.5	870	100	483	100	405	100	membrane OK
2AF4 R13B9	"	350	Fiberglass	3.1	920	100	729	100	461	100	membrane OK, small areas scraped during removal
2BF4 R11B6	"	365	P-84	5.1	337		185		97		membrane delamination throughout entire length of bag
	new	80	NOMEX	5.4	513		408		160		brand new
			new all PPS		366		289		137		
			cond PPS		503		337		241		
			all GT		650						

Table 1. Test Results Summary Chart

All the filter bags when removed contained a thin layer of dust similar to typical coal fired boiler fabric filter particulate collector applications. This residual filter cake and filter bag media air permeability measurement is shown in the " as received Frazier numbers" column. After light brushing, all the filter bag perms returned to near new levels. It should be noted that the higher Frazier number readings occurred when the membrane was scraped during removal, had cracked due to a weakened backer, or had become delaminated.

Felt Strength

Mullen burst tests were run on a portion of samples taken for the air permeability measurements.

The test consists of applying pressure in the reverse direction of airflow on a three inch diameter filter bag sample, continuously increasing the pressure until the sample is ruptured.

The September 2003 sampled filter bags' physical strength of the GORE-TEX® felt backed and conductive PPS felt backed filter bags maintained their strength while the all PPS felt backed filter bags began to show some minor weakening. Once we noticed the weakening of the all PPS felt backed filter bags, we began running a second type of physical strength test using an Instron test device. The Instron measures the tensile strength in both the machine and cross machine direction of the felt using two 2 inch by 5 inch samples. The sample cut with the long dimension in the vertical direction as the filter bag hangs represents the machine direction, the other sample cut with the long dimension cut in the horizontal (circumference) direction represents the cross machine direction. The Instron tests confirmed the all PPS felt backed filter bags had begun to weaken and the results indicated the higher the temperature exposure, the weaker the felt backer had become. A second set of filter bags was pulled in October 2003 and proved the all PPS felt filter bag continued to become weaker as shown in the appendix. By February 2004 the conductive PPS backed filter bags began to exhibit early signs of strength loss, even at the maximum exposed temperature of 322 (F).

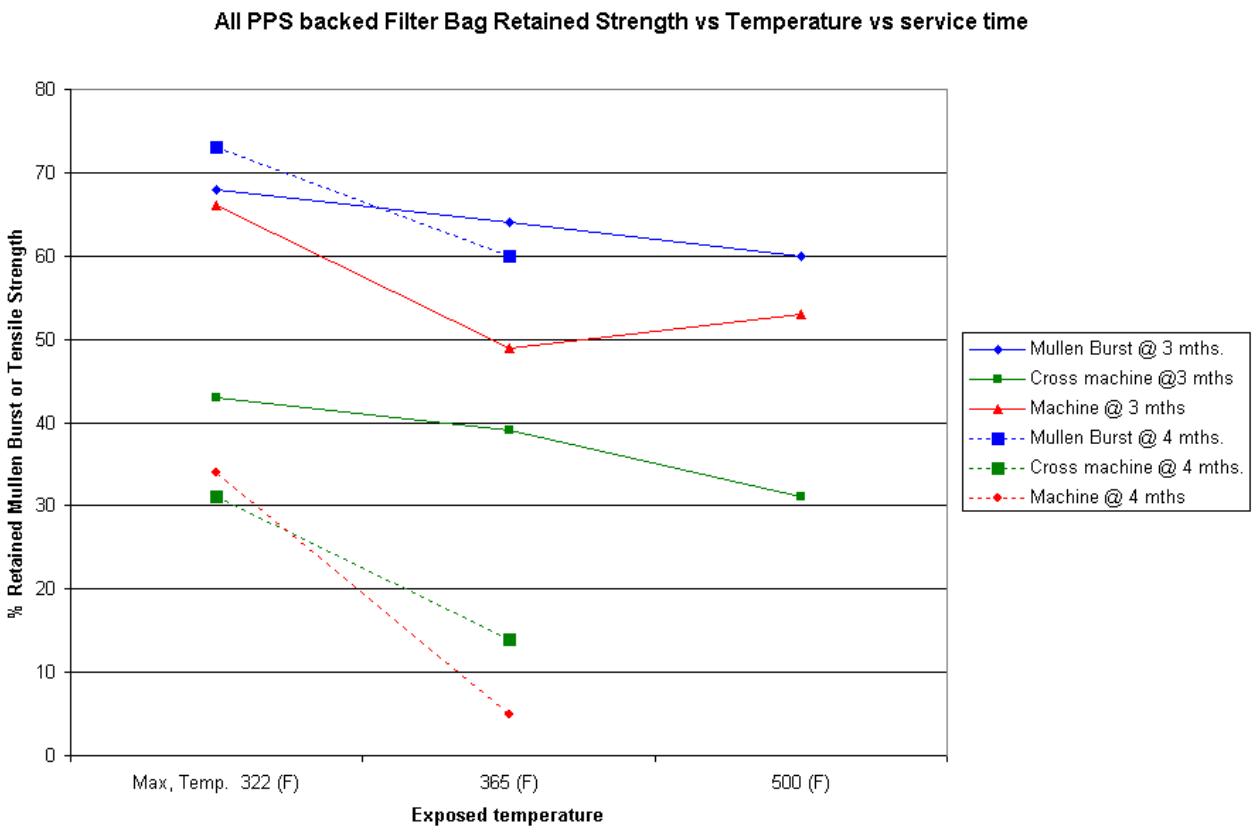
Visual and Microscope Analysis

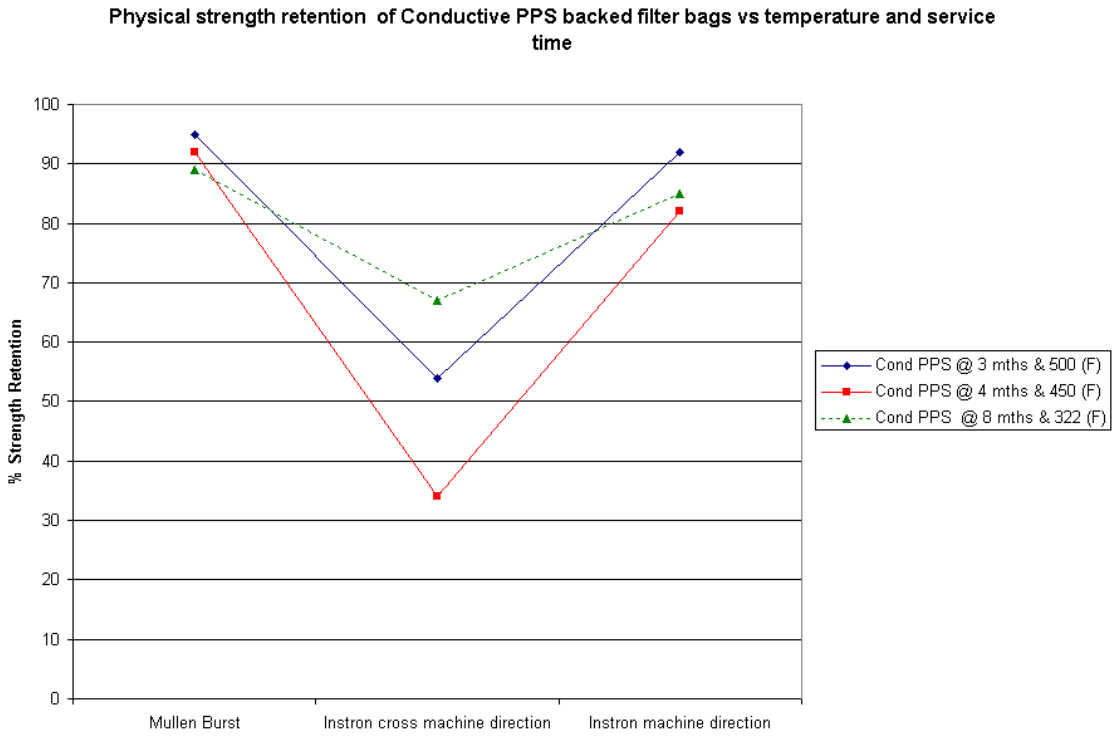
As noted earlier, all the filter bags contained a thin layer of dust cake on the membrane surface, typical of most coal -fired boiler applications. The primary dust cake was easily brushed off all the filter bags. The filter bags were examined for membrane damage from electrostatic discharge or sparking using a microscope - none was observed. However, membrane cracking began to occur with all PPS backed filter bags with the first set removed in September 2003. The conductive PPS backed and GORE-NO STAT® filter bags membrane integrity remained intact. The filter bags pulled February 2004, after two and a half months service, SUPERFLEX® and fiberglass backed filter bags show no membrane or backer wear. The P-84 backed filter bag had from top to bottom areas where the membrane had become delaminated in 1 to 3 inch diameter sections. The redesign of the filter bag incorporated in the June 2003 bag install utilizing a double layer of material in the bottom cuff apparently solved the wear previous seen with the October 2002 installed bags. .

Conclusions:

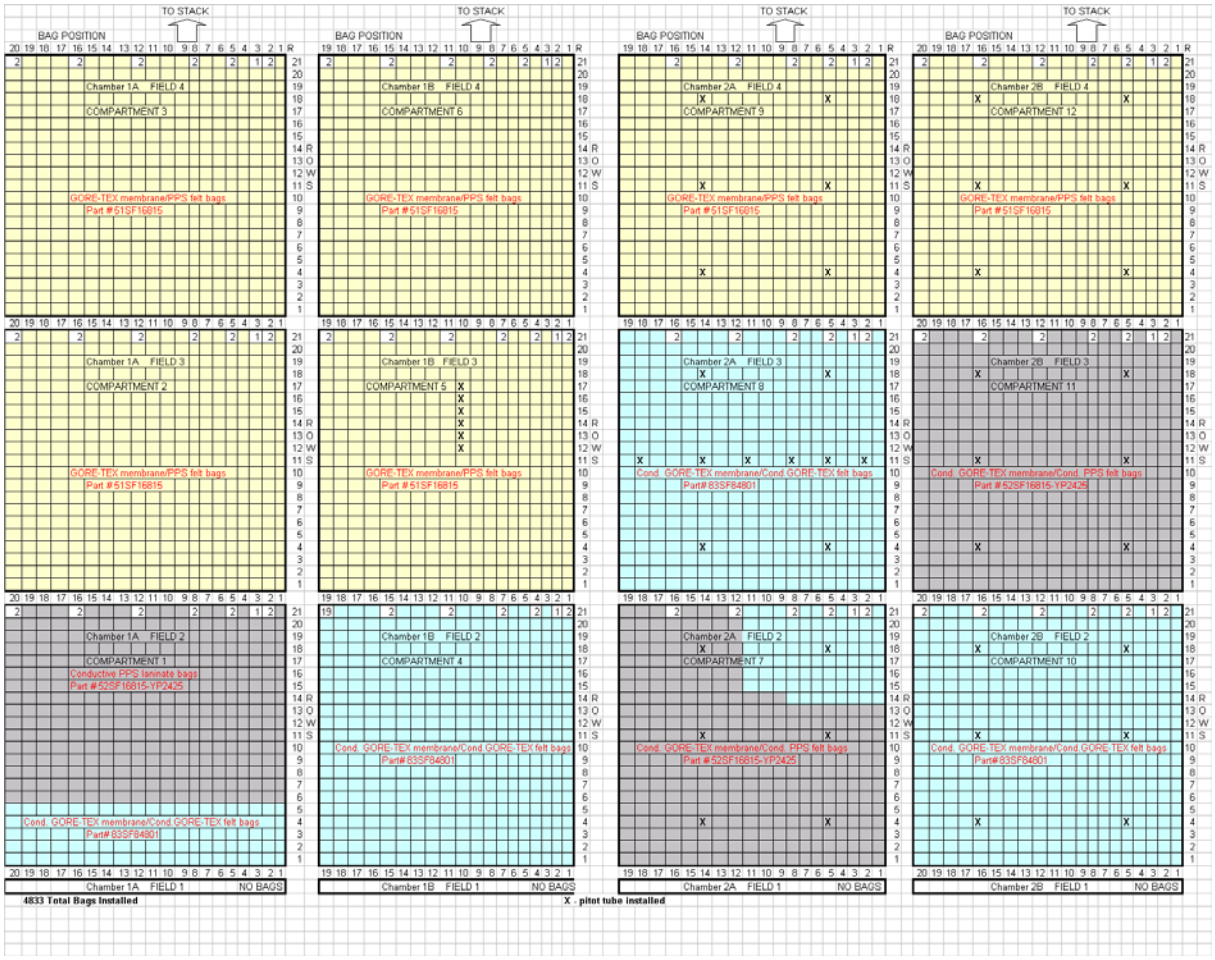
- GORE-NO STAT® filter bags continue to maintain excellent membrane integrity and physical strength.
- Laboratory analysis of the filter bags revealed no membrane damage caused by electrostatic discharge or sparking.
- After 10 weeks of service SUPERFLEX® and fiberglass backed filter bags exhibited no loss in physical strength and membrane integrity.
- The all PPS backed and conductive PPS backed GORE-TEX® membrane filter bags have shown they are sensitive to temperature upsets.
- Future physical strength analysis should include Tensile strength testing, preferably using the Instron instrument.

APPENDIX

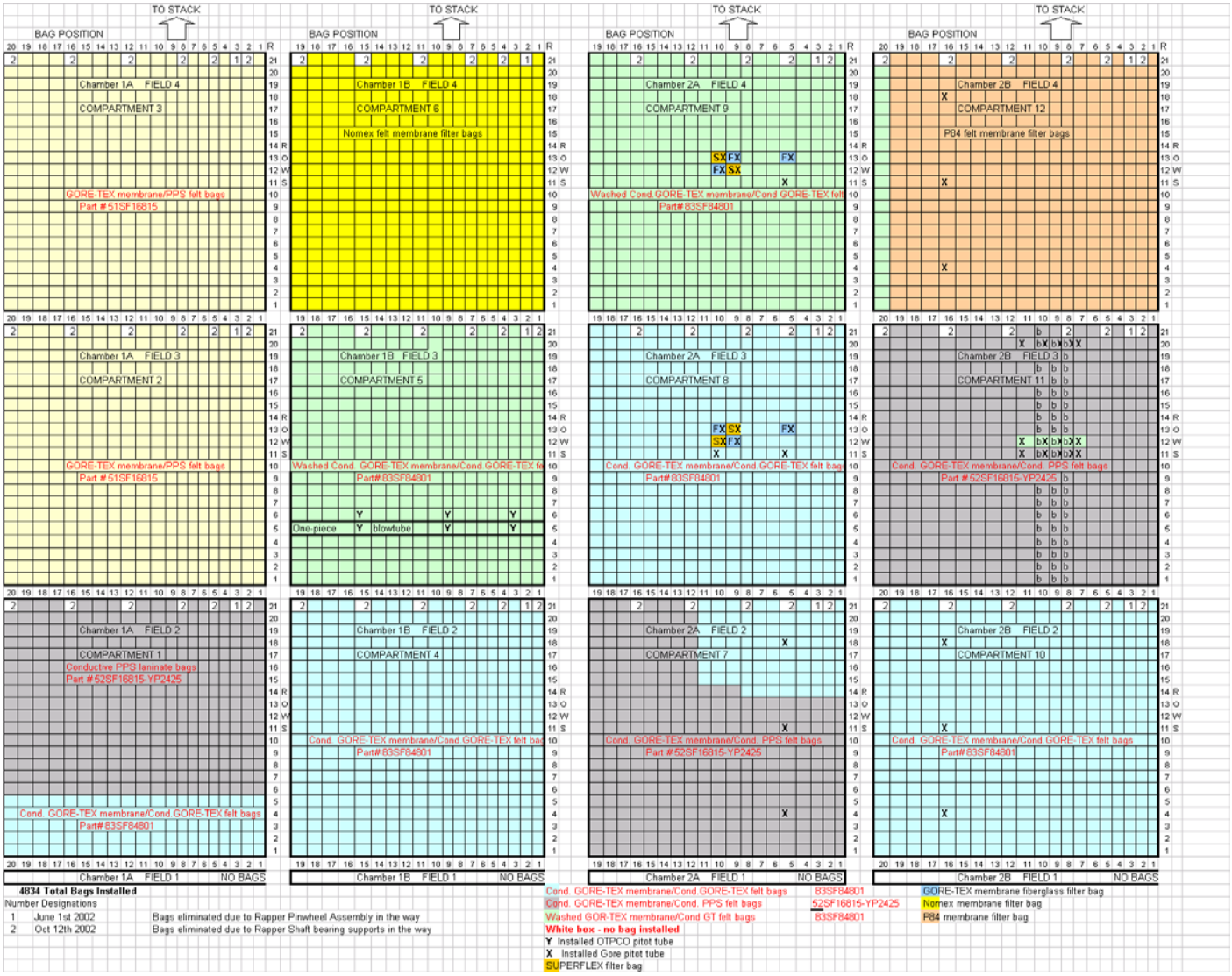

All PPS backed Filter Bag Retained Strength vs Temperature vs service time
% Retained Mullen Burst or Tensile Strength
80
70
60
50
40
30
20
10
0
Max, Temp. 322 (F)
365 (F)
500 (F)
Exposed temperature
Mullen Burst @ 3 mths.
Cross machine @3 mths
Machine @ 3 mths
Mullen Burst @ 4 mths.
Cross machine @ 4 mths.
Machine @ 4 mths


Physical strength retention of Conductive PPS backed filter bags vs temperature and service time
% Strength Retention
100
90
80
70
60
50
40
30
20
10
0
Mullen Burst
Instron cross machine direction
Instron machine direction
Cond PPS @ 3 mths & 500 (F)
Cond PPS @ 4 mths & 450 (F)
Cond PPS @ 8 mths & 322 (F)

Bag Locator Chart for June 11



Bag locator guide for December 20, 2003



B41 EEC Bag analysis report from July 22, 2004

Prepared for:

OTTERTAIL POWER COMPANY
BIG STONE, SOUTH DAKOTA
JULY 22, 2004
TLN 402 J

July 22, 2004
TLN 402 J

REPORT
OTTERTAIL POWER COMPANY

Reference: Filter Bag Evaluations

Eleven filter bags (2 new and 9 used) were received for testing and evaluation. The bags were sampled from an Advanced Hybrid Filter baghouse colleting fly ash off a coal fired boiler operation.

The baghouse is a pulse jet cleaning unit operating at 320°F average to a maximum of 365°F. Pressure differentials are reported to be 8.0" w.c. with a maximum differential of 8.5" w.c.

The bags were identified as follows:

[1]	New Bag – P-84/Membrane BHA Tex
[2]	New Bag – P-84/Membrane BHA Tex
[3]	R1-B8 – installed 12/03 – out 4/04
[4]	R5-B13 – installed 10/02 washed (*) Washed reinstalled 12/03 out 6/04
[5]	R6-B8 – installed 12/03 out 6/04
[6]	R8-B19 – installed 12/03 out 6/04
[7]	R9-B12 – installed 12/03 out 6/04
[8]	R10-B8 – installed 12/03 out 6/04
[9]	R10-B12 – installed 12/03 out 6/04
[10]	R11-B17 – installed 12/03 out 6/04
[11]	R13-B19 – installed washed (*) Washed reinstalled 12/03 out 6/04

The bags are of various generic class (see data sheets) and R5-B12 and R13-B19 were laundered and reinstalled in the unit.

Attached are the results of the testing data.

In general, the as received permeability of the bags yielded generally low throughput characteristics in full profile.

There is no significant differences between the candidates however both laundered candidates (R5-B13 and R13-B19) did generate a lower throughput average.

The following are the average Permeabilities as received of all candidates in order of decreasing

values:

CANDIDATES	AVERAGE PERMEABILITY
R6-B8	2.027
R8-B19	2.023
R11-B17	2.013
R1-B8	1.980
R9-B12	1.973
R10-B8	1.970
R10-B12	1.953
R5-B13	1.950
R13-B19	1.877

The differences are not that significant however, there is about an 8% gain in flows from the lowest to the highest candidate.

All candidates exhibited a generally porous non-agglomerated cake structure.

Microscopic **Photo A and B** are views of this as received porous ash cake structure common to all bags.

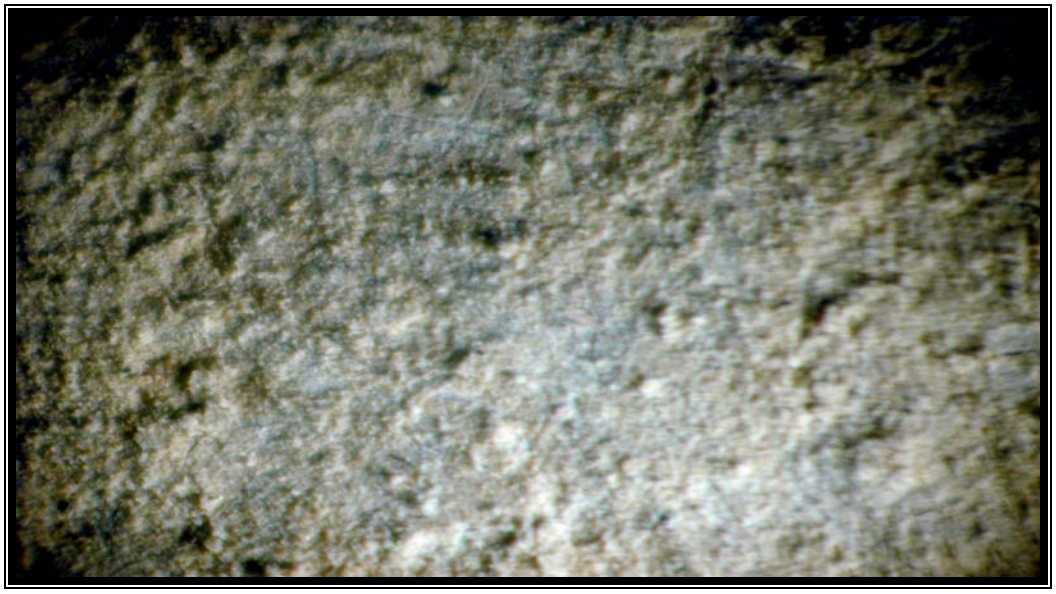


Photo A

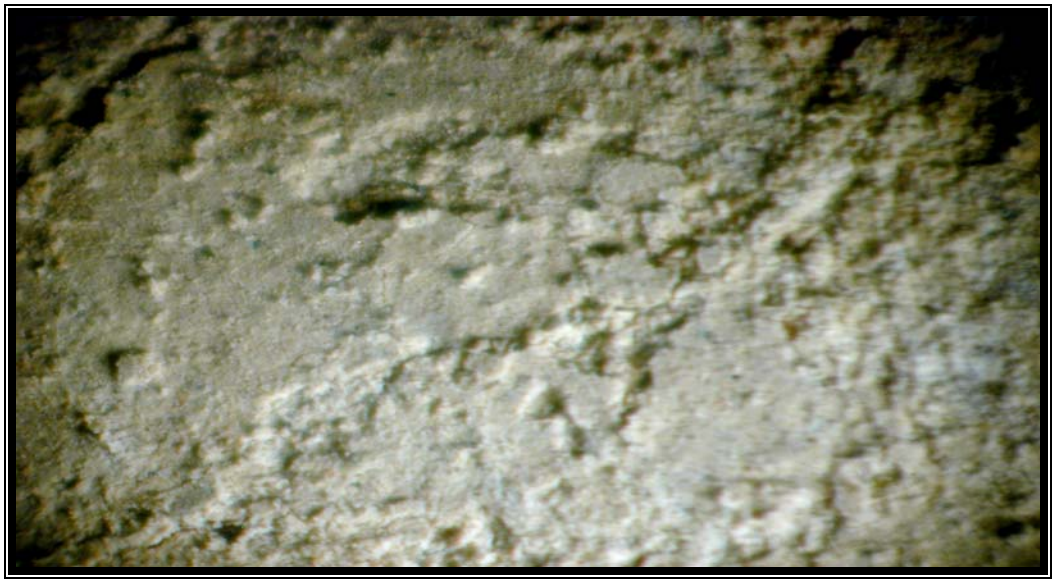


Photo B

Impact generated this outer dust to discharge however directly on the membrane surface were densified ash agglomerations.

Microscopic **Photo C and D** are views of the impacted membrane surface.

Photo C

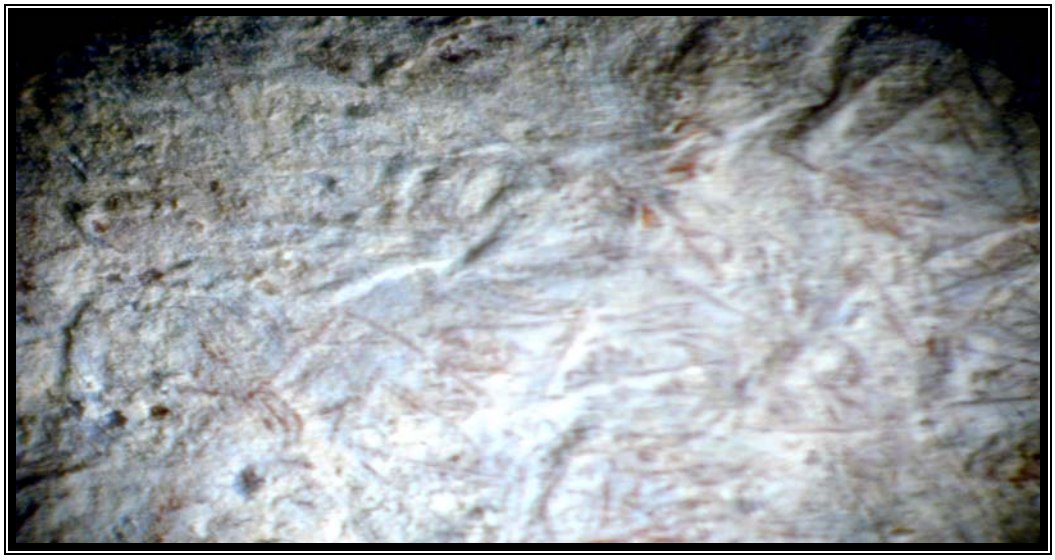


Photo D

This densified thin layer of dust directly on the membrane has caused generally low regain characteristics in Permeabilities.

Again, no significant differences were present between the candidates flow characteristics.

The candidates generally followed the same rankings in regain as the as received conditions.

The following are the required Permeabilities of the candidates:

Candidate	Permeability
R6-B8	2.783
R8-B19	2.770
R11-B17	2.786
R1-B8	2.740
R9-B12	2.813
R10-B8	2.737
R5-B13	2.660
R10-B12	2.760
R13-B19	2.297

The permeability capacity characteristics of the candidates (except R13-B19) are not at any significant differences with very comparable flows.

R13-B19 yielded abnormal levels of regain.

Physical strengths of breaking tenacity and mullen burst strengths on R10-B8 revealed reductions in values uncommon to all other candidates.

Flex characteristics also revealed an uncommon decline in endurances of Bag R10-B8 exhibited by the other candidates.

Considering the limited reported service use of 6 months the Nomex Aramid bag has undergone added degradation not experienced by the other candidates.

The Nomex candidate was extracted for soluble fraction analysis. Titration (Barium Chloride) resulted in positive sulphate salts within the Aramid Nomex polymer chemistry.

These sulphates result from the gaseous sulfur oxides (primarily sulfur trioxide) degrading the Aramid fiber Polymer.

With catalyst such as valadrum, sulfur trioxide is generated to 2-5% levels within the sulfur dioxide and will chemically degrade Nomex.

All other candidates did not exhibit any abnormal deterioration under this limited usage.

All losses from the candidates (except Nomex R10-B8) generated normal declines in physical values resulting from service use.

The extractions generated high levels of alkaline sulphates (calcium sulphate) indicative of

Powder River Basin coal with higher calcium oxide in the ash compared to the level of iron oxide.

This metallic oxide content generates an alkaline chemistry which is not detrimental to any of the candidates.

There is no thermal or chemical deterioration (except R10-B8 Nomex) on the bags with all losses attributed to physical service use fatigue and normal adjustments in values from service use.

All bags exhibited good snap band gasket to tube sheet sealing with no leakage demonstrated.

Examination of the membrane surface revealed no failures/fractures with good bonding to the corresponding sub straight fabric.

Examination of the R5-B12 and R13-B19 (washed candidates) did not exhibit any membrane failures/fractures from the washing procedure.

Bags housed on the 24 wire cages (R18-B12 and R13-B19) did not generate any significant differences in Permeabilities/cleanable compared to the 16 wire candidates.

I would add that fiberglass would undergone reduced cage contact wear/flex with the higher 24 cage wire support and upon time would generally extend bag life on fiberglass.

Conclusions:

- Nomex has undergone sulfur trioxide degradation and under the 6 month exposure has suffered high deterioration. Nomex Aramid is not recommended for service in this application.
- Fiberglass candidates exhibited good retention in physical strengths and flex endurances. Fiberglass reductions have resulted from normal physical service use fatigue and normal adjustments in value from thermal baghouse exposures (normal for fiberglass).
- The PTFE needled felt candidate exhibited no loss in strength and flex fatigue at this current service use.
- P-84 media experienced normal losses in strength and flex endurances.
- The fiberglass, P-84 and PTFE needled felt are exhibited suitable characteristics for use in this application.
- **Life projections of the candidates based on this limited usage/data are as follows: Fiberglass – 4 to 4.5 years, P-84 - 5 to 6 years and PTFE felt – 8 to 9 years.**
- The PTFE expanded membrane of the candidates are all rated at comparable performances.
- All membrane candidates generated good ash collection characteristics with no penetration beyond the membrane.
- **Photo E** is a cross sectional typical to all bags revealing the internal depths of the media void of any dust penetration.

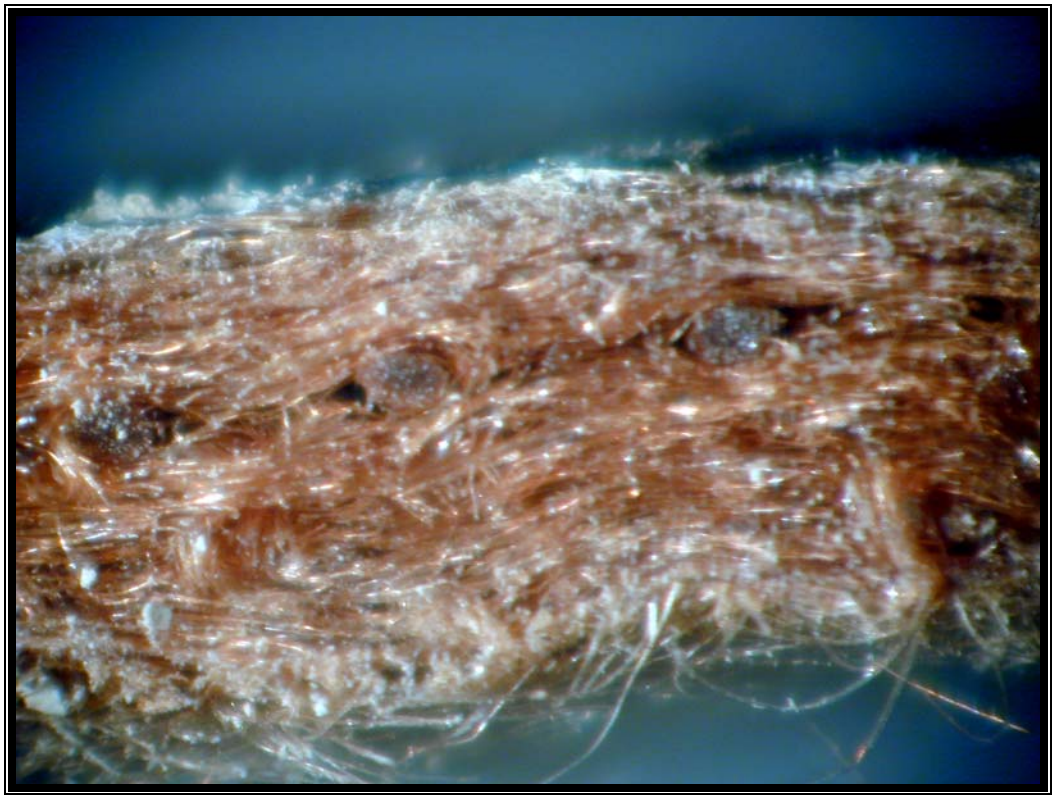


Photo E

FABRIC	**NEW**	**NEW**
FIBER	P-84	P-84
TYPE	NEEDLED	NEEDLED
SCRIM SUPPORT	YES	YES
SCRIM WEAVE	PW	PW
SCRIM YARN	SPUN	SPUN
SCRIM COUNT (W X F)	24 X 23	24 X 24
WEIGHT (OZ/SQ YD)	18.74	17.61
THICKNESS (INCHES)	.084	.080
DENSITY (OZ/CUBIC INCH)	0.1721	0.1698
PERMEABILITY (CFM)	6.9	7.3
MULLEN BURST (LBS/SQ INCH)	611	604
TENSILE (LBS/INCH) WARP FILLING	 198 317	 203 305
FINISH	MEMBRANE	MEMBRANE
TYPE	PTFE	PTFE
MEMBRANE QUALITY	GOOD	GOOD

FABRICATION	**NEW**	**NEW**
FLAT WIDTH (INCHES)	9.75	9.78

DIAMETER (INCHES)	6.21	6.23
OAL	NO BAND TOP PRESENT	CUT OFF
BOTTOM CUFF (INCHES)	5.9	6.0
BOTTOM CUFF STITCH	LOCK	LOCK
BOTTOM CUFF STITCH ROWS	2	2
BOTTOM CUFF STITCH YARN	PTFE	PTFE
BOTTOM CUFF STITCHES PER INCH	5.2	5.3
SEAM TYPE	OVERLAP	OVERLAP
SEAM STITCH	CHAIN	CHAIN
SEAM STITCH ROWS	3	3
SEAM STITCH YARN	PTFE	PTFE
SEAM STITCHES PER INCH	6.8	6.5

B42 EEC Bag analysis report from December 3, 2004

Prepared For:

OTTER TAIL POWER COMPANY
BIG STONE CITY, SOUTH DAKOTA
DECEMBER 3, 2004
TLN 618 J

REPORT
OTTER TAIL POWER COMPANY

Reference: Big Stone Plant
TLN 402J of 7/22/04

Four filter bags were submitted for complete evaluations. The bags were labeled as "10-H Advanced Hybrid", "8-G Advanced Hybrid", "2AF3 Advanced Hybrid" and "None – Cole Unloading".

Coal Unloading:

The bag is from a pulse jet unit collecting residual dust from the coal unloading area. The differential pressure levels are 7" w.c. and maintained by an ID damper system. As pressures elevate the flows are reduced to maintain the dp. Temperatures are ambient with current service use @ 3 years.

The submitted bag as received exhibited low permeability throughput acceptances in full profile. Examination of the dust cake revealed a non-agglomerated porous structure with no major obstructions to throughput present.

Cross sectional inspection revealed the cause for the low permeability characteristics.

Microscopic **Photo A and B** are cross sectional views revealing the presence of fine micron dust penetration into the media depths.

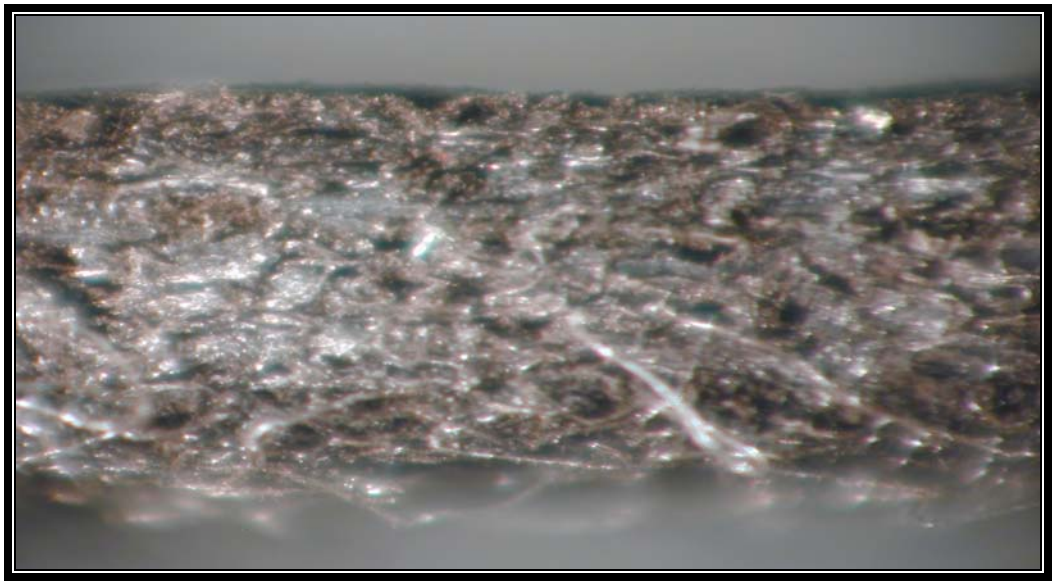


Photo A

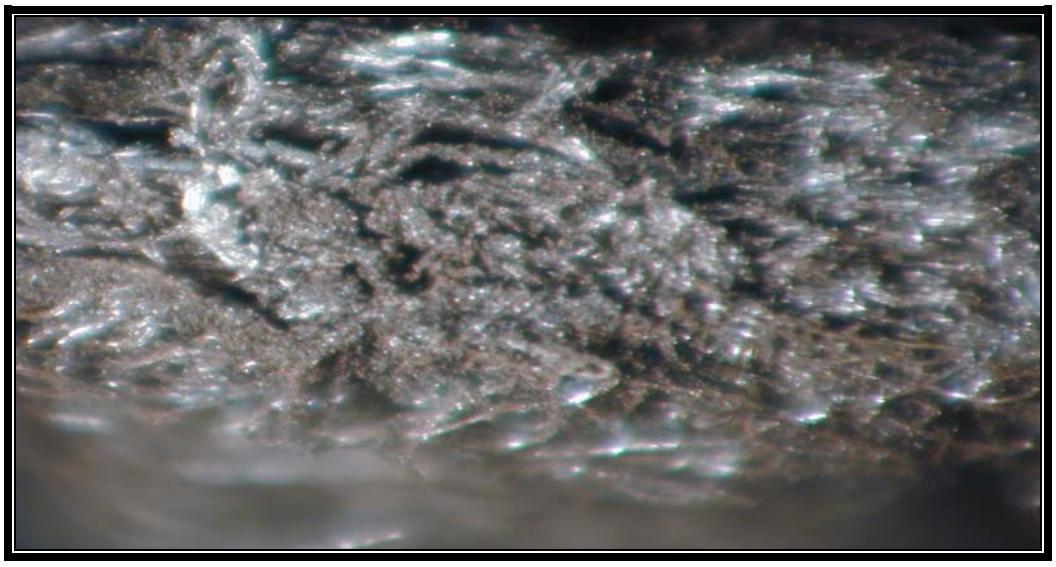


Photo B

The filtration efficiency of this media is at questionable levels.

The use of Duo-density Polyester may be a more suitable replacement when change out is scheduled.

The current chemistry/temperature of the PRB coal unloading is not detrimental to Polyester with no hydrolysis potential present.

Physical strengths and flex endurances of the bag are at good retention levels in full profile.

All current losses are attributed to physical service use.

This bag is rated at a 35% maximum termination indicative of good continued service use potential. No abnormal wear was demonstrated on this bag.

Advanced Hybrid Filter – Fly Ash

All three bags exhibited a porous ash cake common to Powder River Basin Coal ash. This PRB ash contains higher levels of calcium oxide compared to Iron Oxide, hence, the predominant sulphate is the ALKALINE calcium sulphate.

The Permeabilities as received did exhibit a viable level of through. The following are the average permeability flows:

CANDIDATE	PERMEABILITIES
10-H	2.090
8-6	2.083
2AF3	1.753

The two P-84 membrane candidates (10-H and 8-G) exhibited very abnormal losses in all breaking strengths and mullen burst values in full profile.

Further the bags are at or very near full hole formations with H-10 already demonstrating vertical hole.

Flex endurances on both bags also demonstrated severe losses in full profile with flex fatigue levels at 80%.

The added physical fatigue on the bag fold merely added sufficient stress/strain to generate the vertical failure.

The bag fold is the result of normal bag over sizing in circumference compared to the cage circumference.

This over sizing is necessary for cage insertion and the popping action off the bag under pulse for cleaning.

This does become the flex position common to all pulse jet bags hence, merely fails along the vertical fold first.

The high losses both on flex positions and off flex zones is indicative of all degradation sources beyond normal physical fatigue.

The fiberglass candidate did not exhibit any significant declines in strength and flex characteristics.

Extractions of the media less dust revealed the presence of sulphate (acidic) with the P-84 Imide chemistry.

Further nitrates were also present in the current chemistry of the P-84 fibers.

The fiberglass was negative of Nitrate involvement in the inorganic fiber chemistry with only Sulphates detected (slight) and they were acidic.

Power River Basin coal will always yield alkaline calcium sulphates in the ash chemistry. However sulfur gases passing through the membrane (ash does not) and condenses out will generate the acid condensate of sulfuric acid which will attack P-84 as well as Nomex.

Also N0x condensate will do the same thing and condensate out as nitric acid which will attack the P-84 however, not the fiberglass.

The low deterioration on the 2AF3 bag and the high degradation on 10-H and 8-G strongly suggests that moisture condensate in contact with N0x occurred within the clean air side of the system generating the nitric acid and further degrading P-84 as demonstrated by the P-84 degradation and the nitrates within the fiber.

Evidence of clean side moisture corrosion was also demonstrated.

Photo C and D are views of the clean side of the 2AF3 revealing the staining that has occurred.

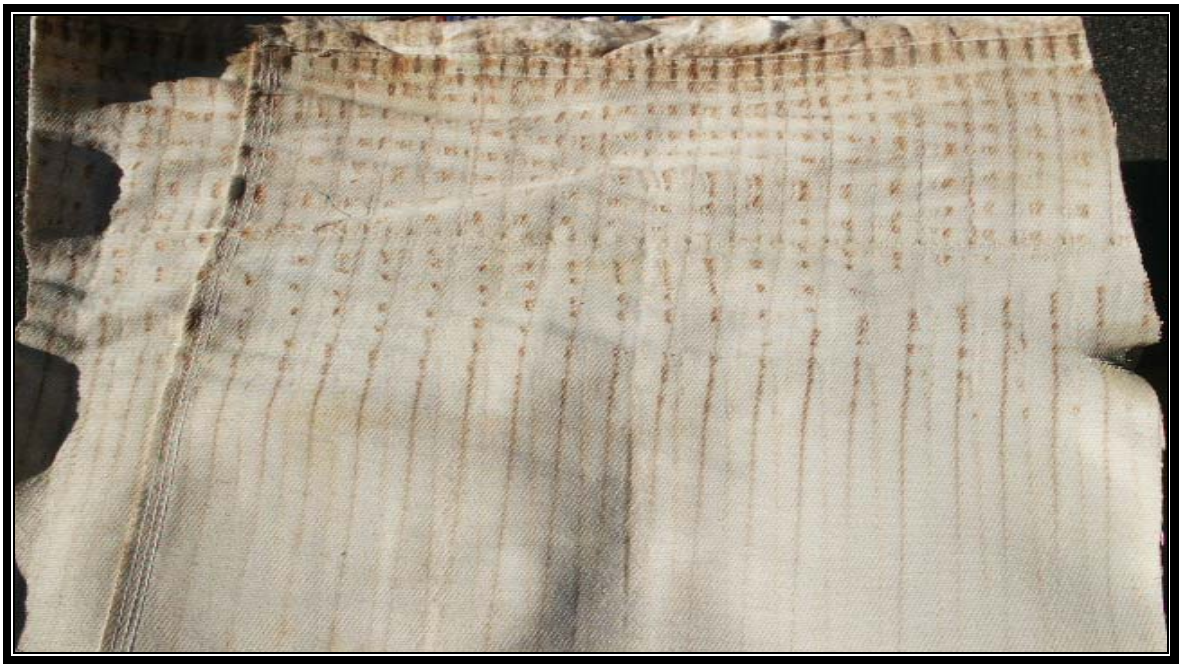


Photo C

Photo D

The rust material tested positive for both metallic sulphates/nitrates further indicative of the acid generation on the clean air side.

It is evident that moisture has entered the clean air side (plenum) of the baghouse causing the exiting gases of sulfur oxides and nitrogen oxides to condense out as the acid.

This situation has occurred between the sampling of TLN 402J (7/22/04) and the failures being experienced. Clean side condensates are most commonly associated with inleakage of cool air/moisture or moisture condensates in the pulse air line. Further, these acids will also generate rust within the metal fractures such as the cages.

B43 Addendum - Startup report after the replacement of the inlet field.

STARTUP REPORT
FOR
OTTERTAIL POWER COMPANY
BIG STONE PLANT
MILBANK, SOUTH DAKOTA
JUNE 30, 2005
BY: BEN ABBOTT

This is a startup report for ESP's 1 and 2 after SEI"s modification to the first fields and bag replacement.

Forry ERC 1001 Rapper Controller and Rappers:
Single impact rappers were installed on the high voltage frame of the first fields. All rappers were installed and adjusted properly. The Forry ERC 1001 rapper controller was set up and programmed. The rapper controller and all rappers are working properly. A copy of the rapper controller set up and program is included with this report. Five plant electricians were trained on the operation of the rapper controller.

Automatic Voltage Controls (AVC) and Transformer Rectifier (TR) Sets:
During construction some TR sets were relocated to different locations. The AVC's need to be edited to match the name plate ratings of the TR sets. Attached are the settings and operational parameters that are in the AVC's along with suggested settings and parameters. Also attached are the air load readings of the AVC's.

There is a close clearance at the bottom tadpole on the first field of all four chambers. Due to this close clearance the first fields were limited to 21 to 26 kV.

With the exception of some sparking, all other fields had good air load readings.

Air load readings are attached.

Support Insulator Heaters:
After drying out the girder boxes, all heaters worked properly.

First field Outlet Dampers:
All four dampers were operated and work properly. The limit switch on chamber 1A did not always indicate the full open position. The plant was to adjust the limit switch the next day.

Tumbling Hammers:
The rotation and operation of all tumbling hammers were checked and worked properly.

OPERATIONAL VALUES

AVC	PA	PV	SA	SV	SPARK QUENCH	ARC QUENCH	FAST RAMP	SET BACK	S/M	SCR
1A1	327	480	2000	25	1	3	6	20	99	30
*	327	480	2000	55	2	4	4	10	60	30
1A2	327	480	2000	55	1	3	6	5	20	30
*	327	480	2000	55	2	4	4	10	30	30
1A3	327	480	1000	55	1	3	6	5	20	30
*	245	480	1500	55	2	4	4	10	30	30
1A4	327	480	1000	55	1	3	6	5	20	30
*	245	480	1500	55	2	4	4	10	30	30
1B1	267	480	2000	25	1	3	6	20	99	30
*	245	480	1500	55	2	4	4	10	60	30
1B2	327	480	1000	55	1	3	6	5	20	30
*	327	480	2000	55	2	4	4	10	30	30
1B3	327	480	1000	55	1	3	6	5	20	30
*	245	480	1500	55	2	4	4	10	30	30
1B4	327	480	1000	55	1	3	6	5	20	30
*	245	480	1500	55	2	4	4	10	30	30
2A1	327	480	2000	21	1	3	6	20	99	30
*	327	480	2000	55	2	4	4	10	60	30
2A2	327	480	1000	55	1	3	6	5	20	30
*	327	480	2000	55	2	4	4	10	30	30
2A3	327	480	1000	55	1	3	6	5	20	30
*	245	480	1500	55	2	4	4	10	30	30
2A4	327	480	1000	55	1	3	6	5	20	30
*	327	480	2000	55	2	4	4	10	30	30
2B1	327	480	2000	55	1	3	3	10	99	30
*	327	480	2000	55	2	4	4	10	60	30
2B2	327	480	2000	50	1	3	6	5	20	30
*	327	480	2000	55	2	4	4	10	30	30
2B3	327	480	1000	55	1	3	6	5	20	30
*	245	480	1500	55	2	4	4	10	30	30
2B4	327	480	1000	55	1	3	6	5	20	30
*	245	480	1500	55	2	4	4	10	30	30

* SUGGESTED VALUES (NOTE: Due to time constraints during air load the suggested values were not implemented. It was discussed that after the boiler was brought back on line, some of the operating parameters would need to be changed. The plant said they could handle this if it is necessary to do so).

AIR LOAD READINGS

Chamber 1A

FIELD	PV	PA	SA	SV	SCR	KW	S/M
1	148	140	664	25	115	17	0
2	73	249	296	38	122	9	19
3	148	260	640	44	108	39	19
4	158	280	794	54	97	55	17

Field 1 limited at 25 kV due to excessive sparking at higher kV.

Chamber 1B

FIELD	PV	PA	SA	SV	SCR	KW	S/M
1	161	144	723	25	113	18	0
2	66	211	343	52	103	26	15
3	143	295	586	44	100	42	19
4	113	258	458	50	100	23	19

Field 1 limited at 25 kV due to excessive sparking at higher kV.

Chamber 2A

FIELD	PV	PA	SA	SV	SCR	KW	S/M
1	113	130	450	21	125	9	0
2	124	330	430	47	106	15	19
3	133	289	527	58	100	26	15
4	121	243	545	53	100	37	14

Field 1 limited at 21 kV due to excessive sparking at higher kV.

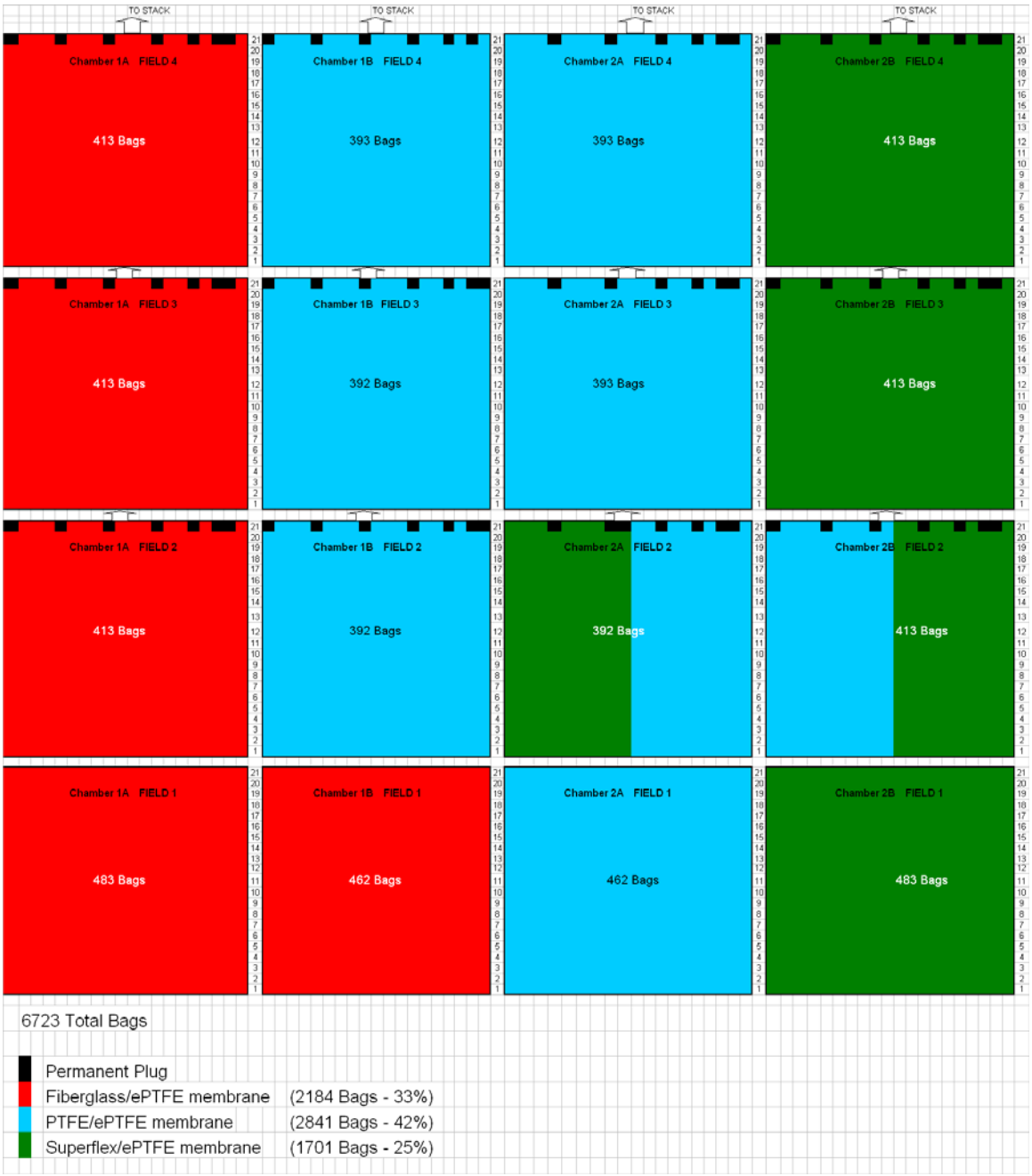
Chamber 2B

FIELD	PV	PA	SA	SV	SCR	KW	S/M
1	180	150	820	26	110	21	0
2	170	321	420	53	96	25	18
3	165	227	432	42	117	35	22
4	106	244	474	46	113	28	19

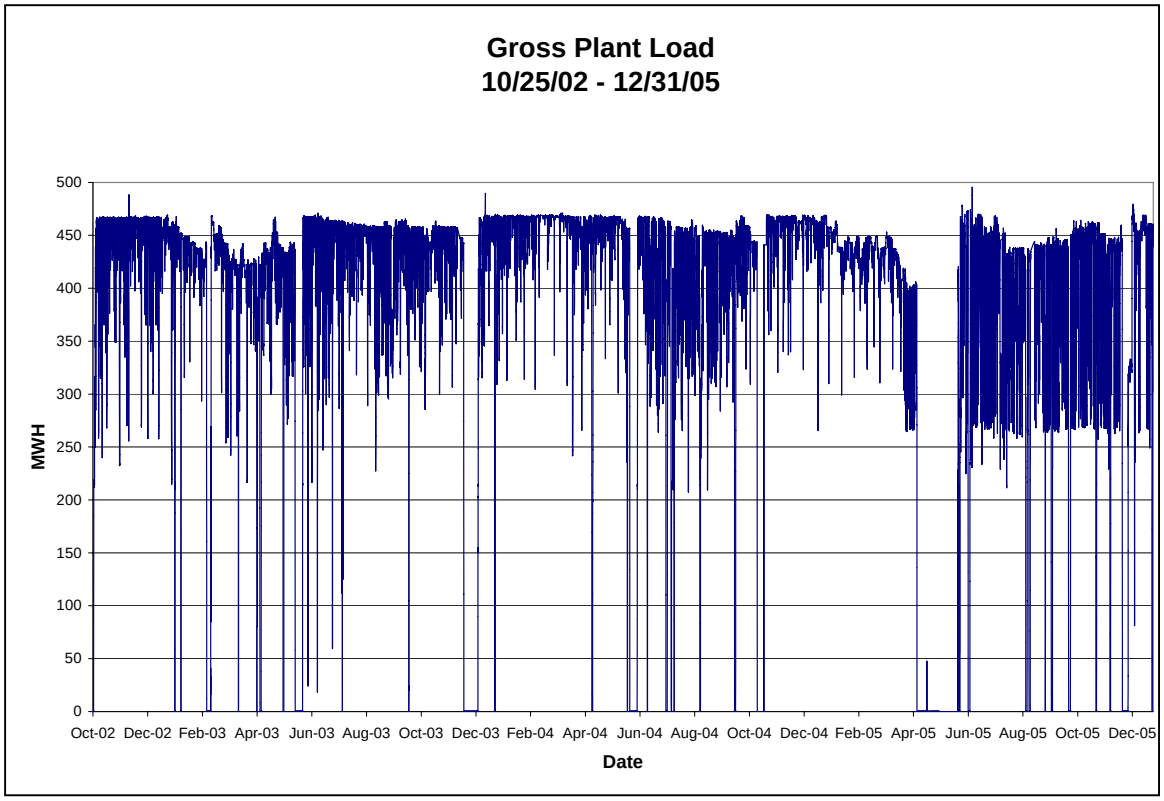
Field 1 limited at 26 kV due to excessive sparking at higher kV.

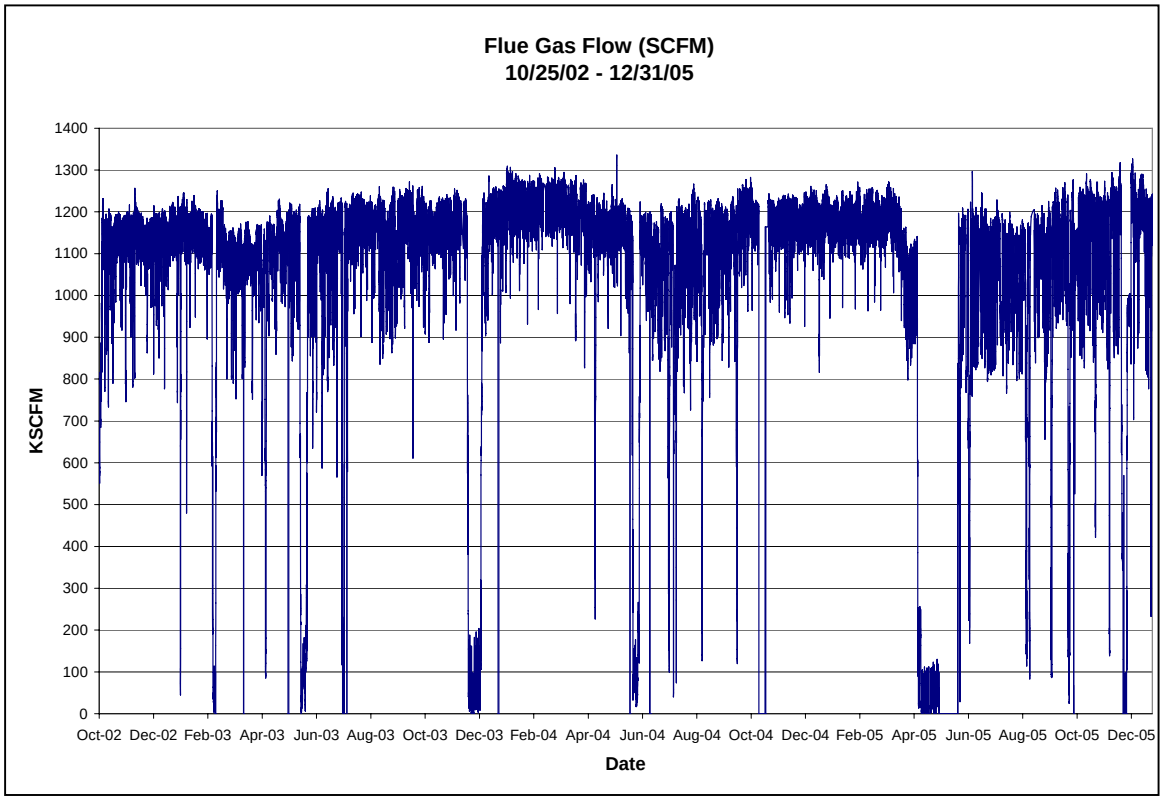
Note: If kV limit is raised on fields 1 the spark rate goes up to approximately 100 S/M.

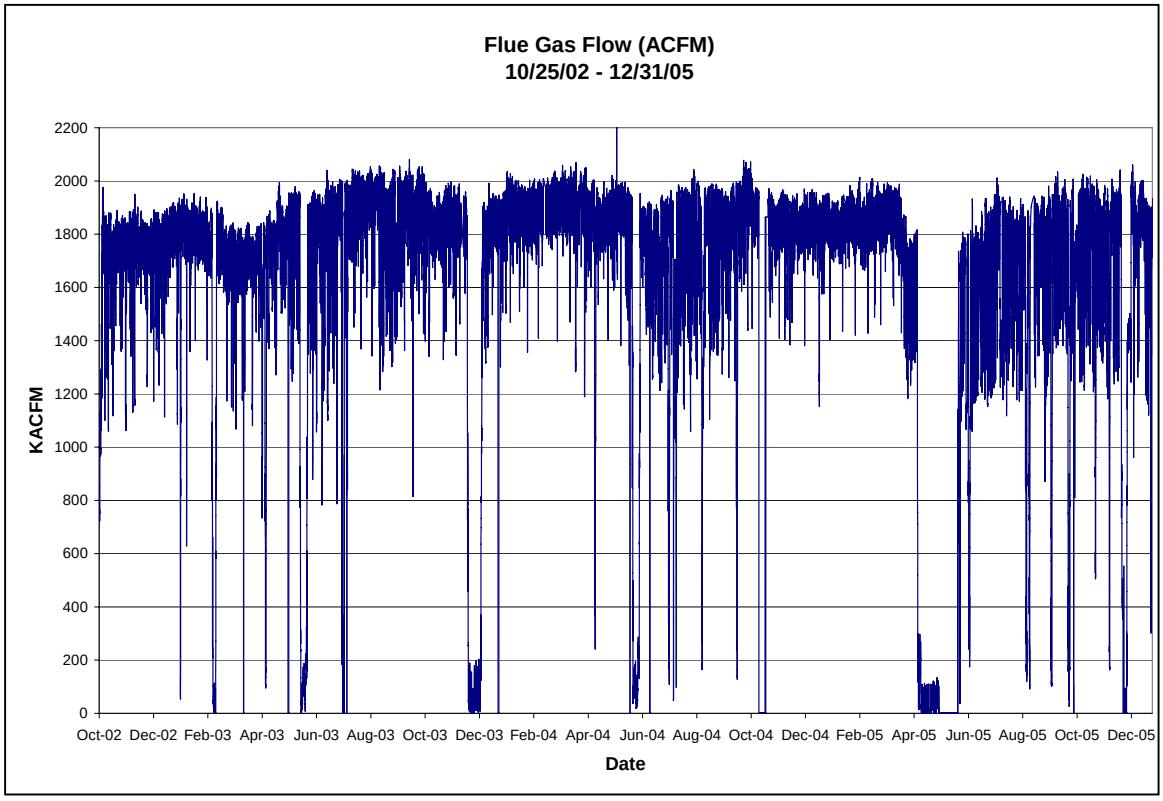
B44 Addendum - Bag Layout map after installation of AH components in the inlet field

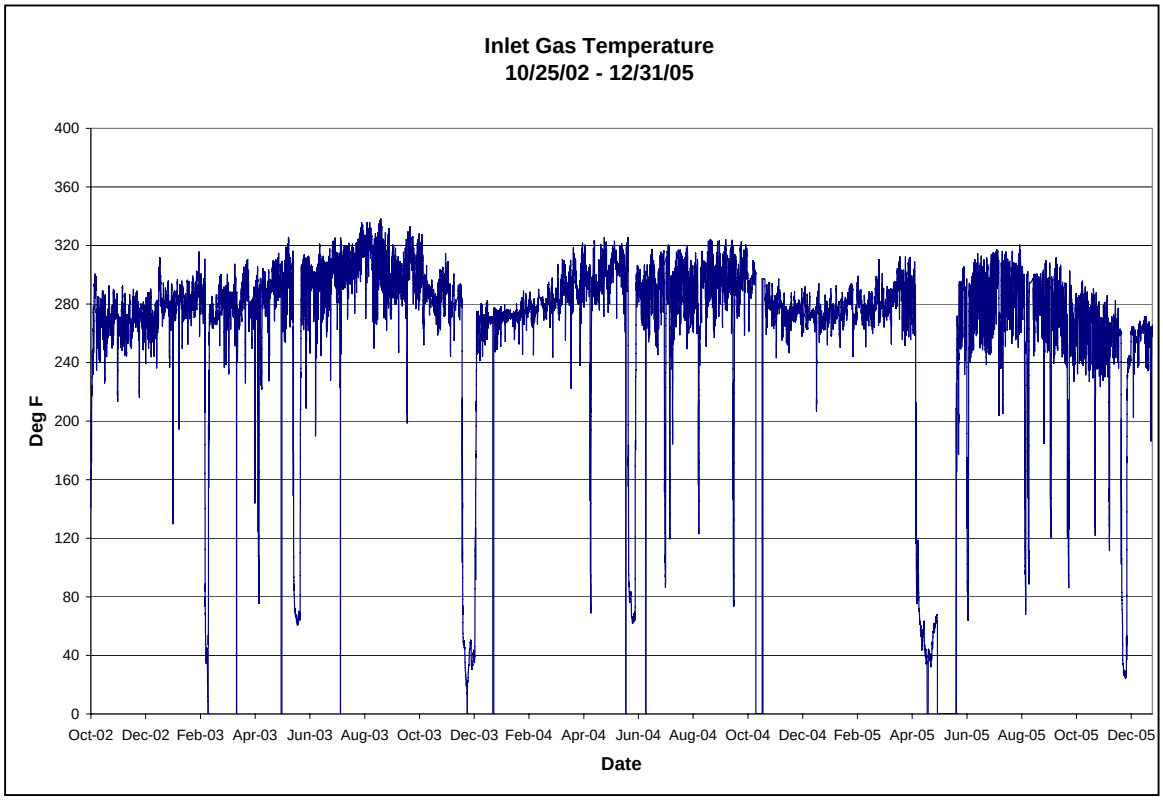


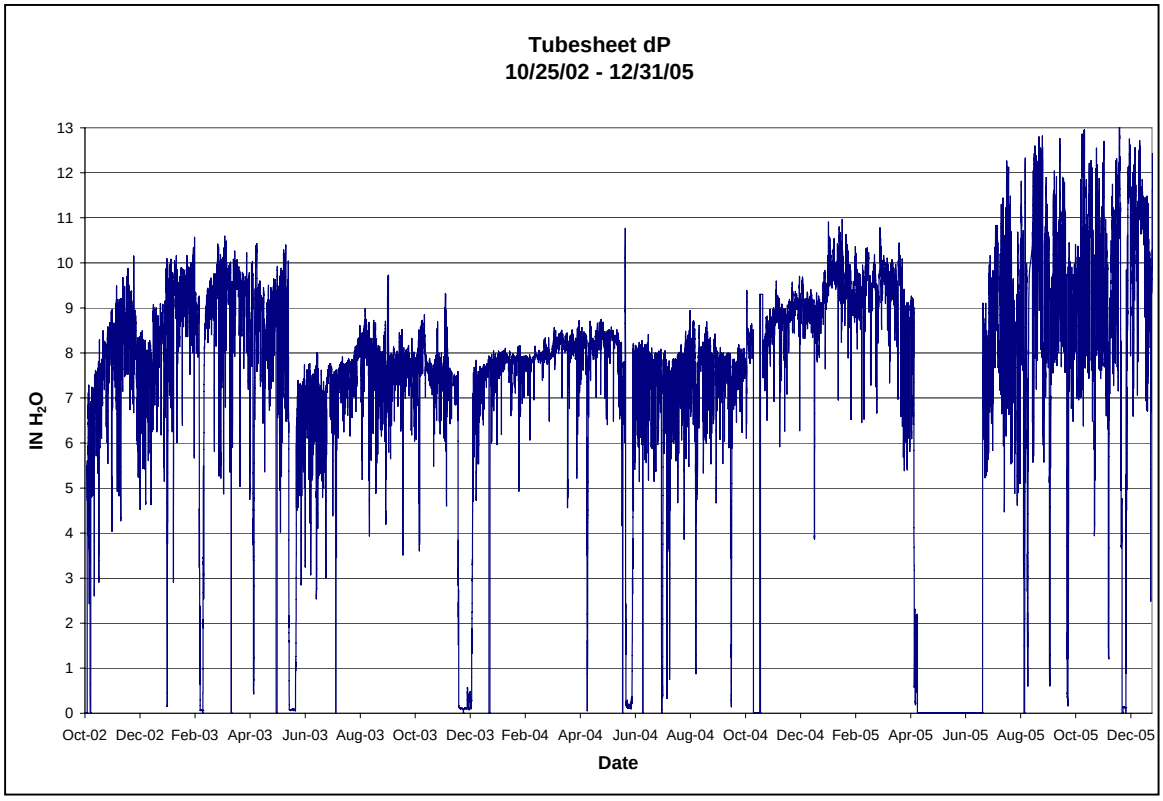
B45 Addendum - Performance Graphs from 10/2002 through 12/2005

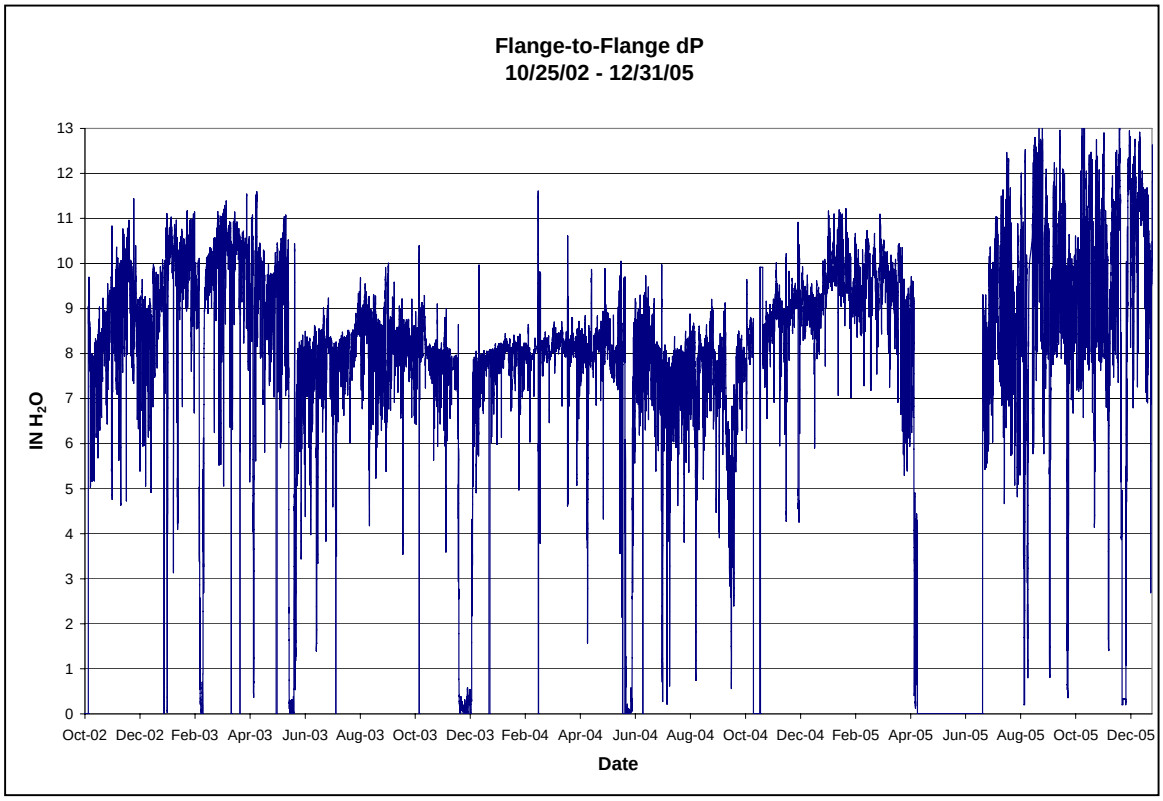


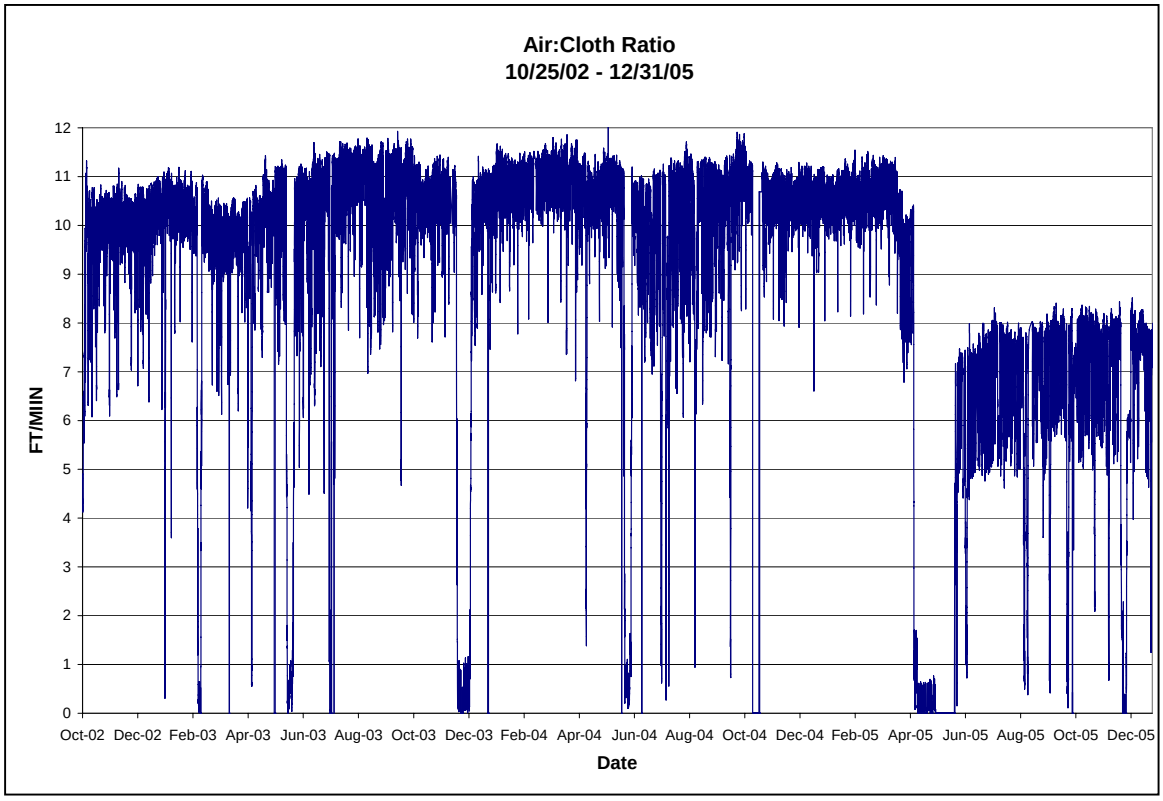


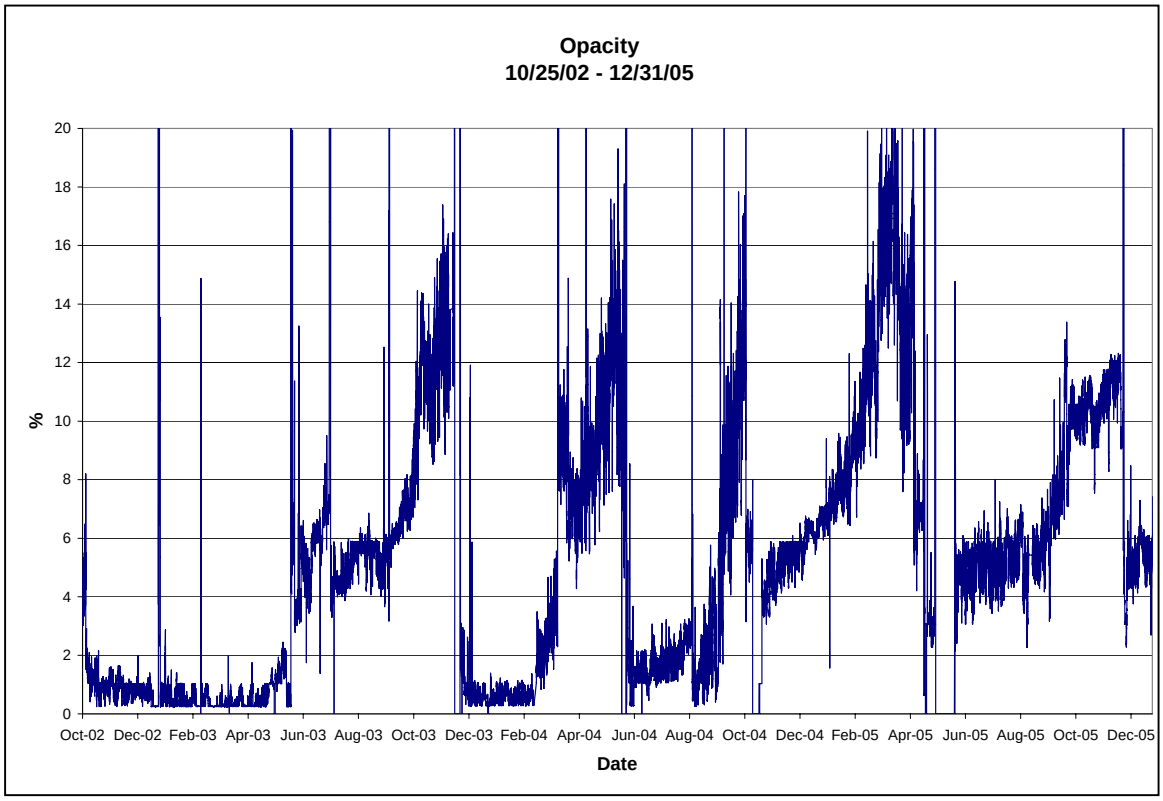

Flue Gas Flow (ACFM)
10/25/02 - 12/31/05
KACFM
2200
2000
1800
1600
1400
1200
1000
800
600
400
200
0
Oct-02 Dec-02 Feb-03 Apr-03 Jun-03 Aug-03 Oct-03 Dec-03 Feb-04 Apr-04 Jun-04 Aug-04 Oct-04 Dec-04 Feb-05 Apr-05 Jun-05 Aug-05 Oct-05 Dec-05
Date

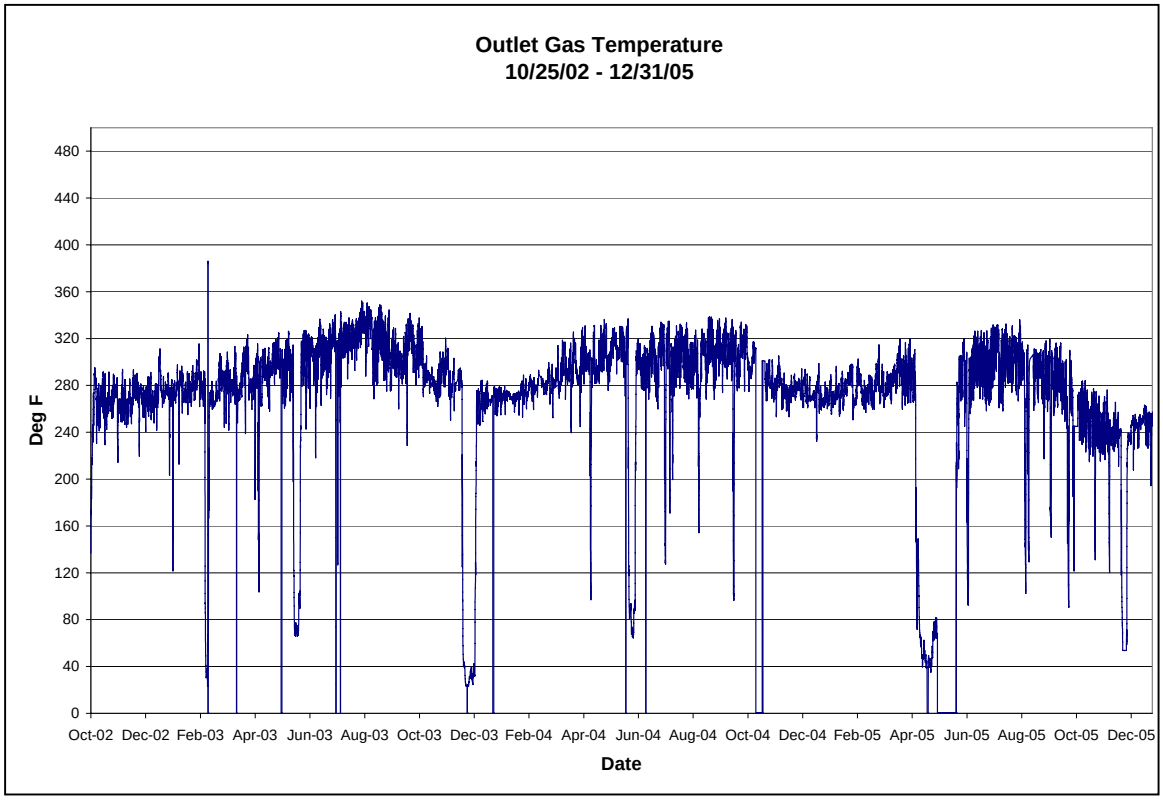

Inlet Gas Temperature
10/25/02 - 12/31/05
Deg F
400
360
320
280
240
200
160
120
80
40
0
Oct-02 Dec-02 Feb-03 Apr-03 Jun-03 Aug-03 Oct-03 Dec-03 Feb-04 Apr-04 Jun-04 Aug-04 Oct-04 Dec-04 Feb-05 Apr-05 Jun-05 Aug-05 Oct-05 Dec-05
Date

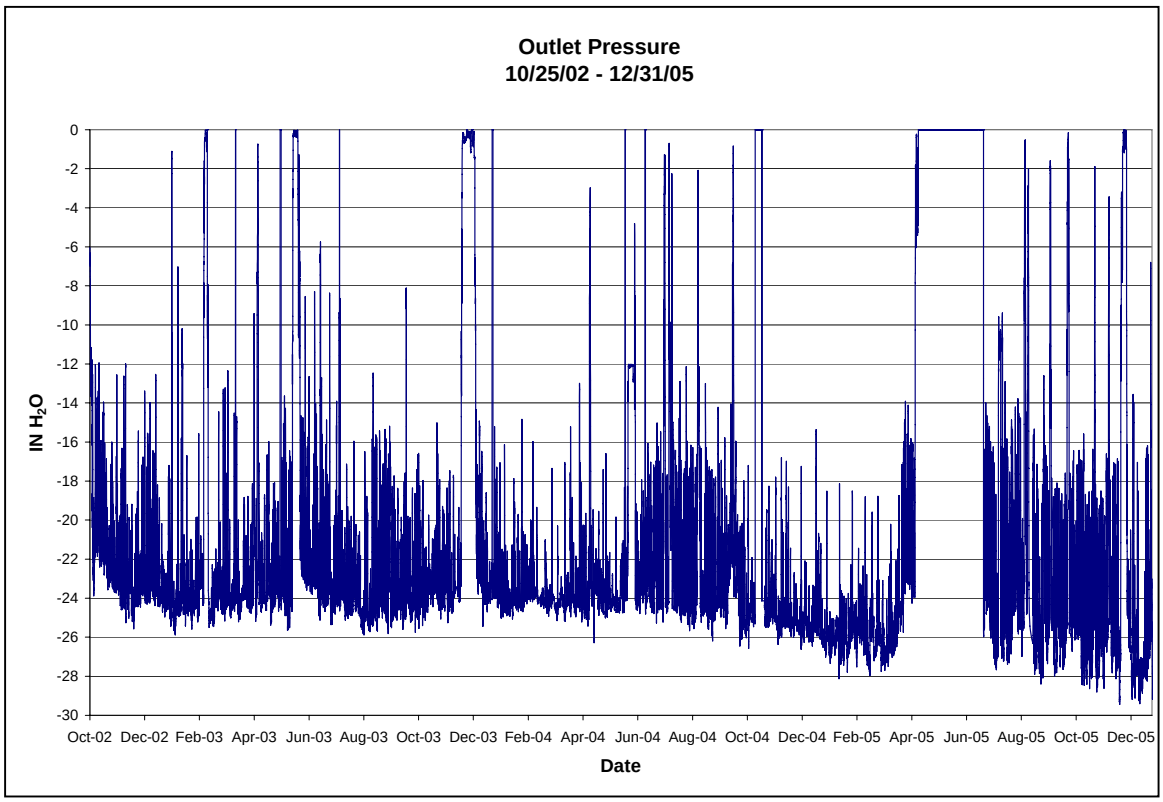

Tubesheet dP
10/25/02 - 12/31/05
IN H2O
0
1
2
3
4
5
6
7
8
9
10
11
12
13
Oct-02 Dec-02 Feb-03 Apr-03 Jun-03 Aug-03 Oct-03 Dec-03 Feb-04 Apr-04 Jun-04 Aug-04 Oct-04 Dec-04 Feb-05 Apr-05 Jun-05 Aug-05 Oct-05 Dec-05
Date

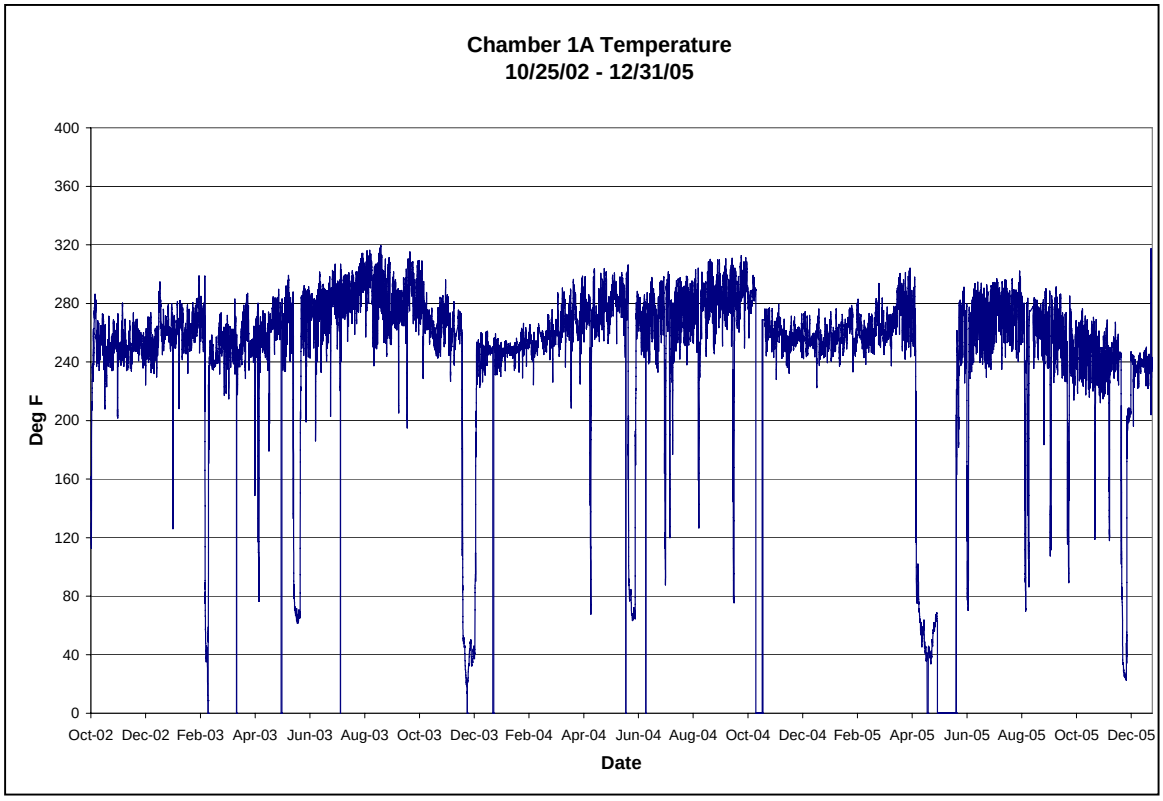

Flange-to-Flange dP
10/25/02 - 12/31/05
IN H2O
0
1
2
3
4
5
6
7
8
9
10
11
12
13
Oct-02 Dec-02 Feb-03 Apr-03 Jun-03 Aug-03 Oct-03 Dec-03 Feb-04 Apr-04 Jun-04 Aug-04 Oct-04 Dec-04 Feb-05 Apr-05 Jun-05 Aug-05 Oct-05 Dec-05
Date

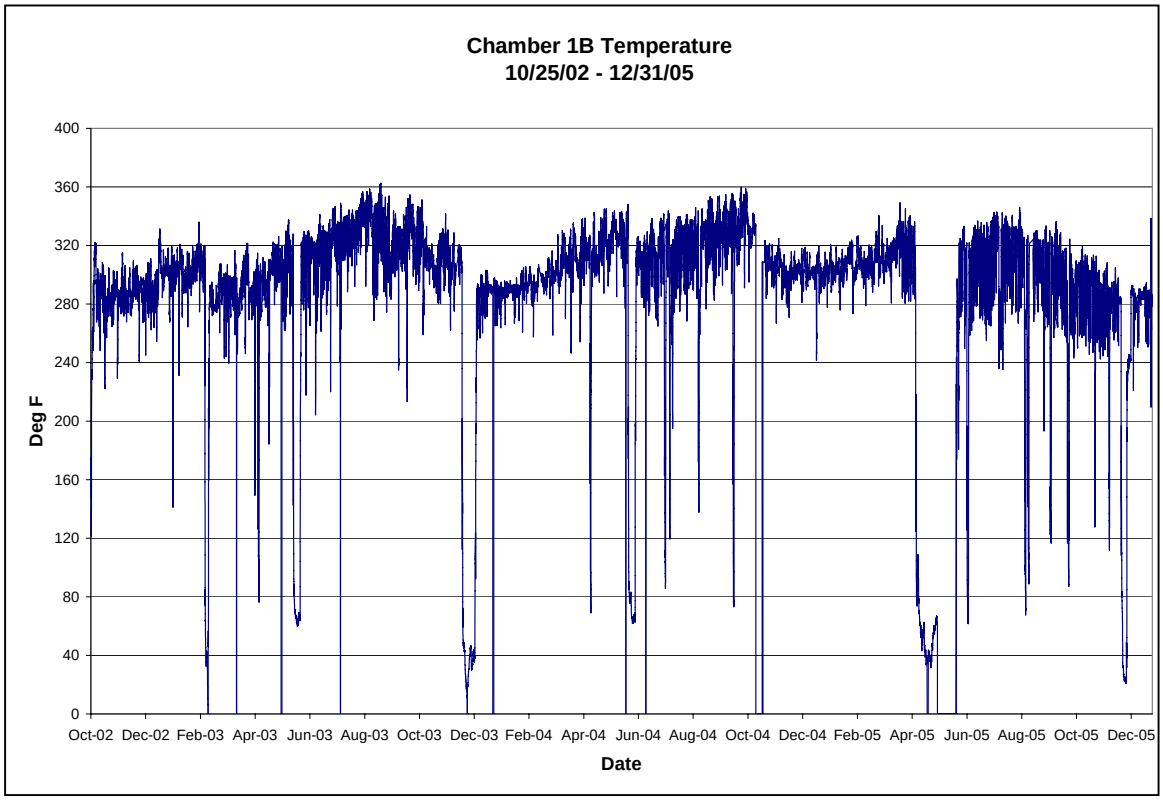

Air:Cloth Ratio
10/25/02 - 12/31/05
FT/MIIN
0
1
2
3
4
5
6
7
8
9
10
11
12
Oct-02 Dec-02 Feb-03 Apr-03 Jun-03 Aug-03 Oct-03 Dec-03 Feb-04 Apr-04 Jun-04 Aug-04 Oct-04 Dec-04 Feb-05 Apr-05 Jun-05 Aug-05 Oct-05 Dec-05
Date

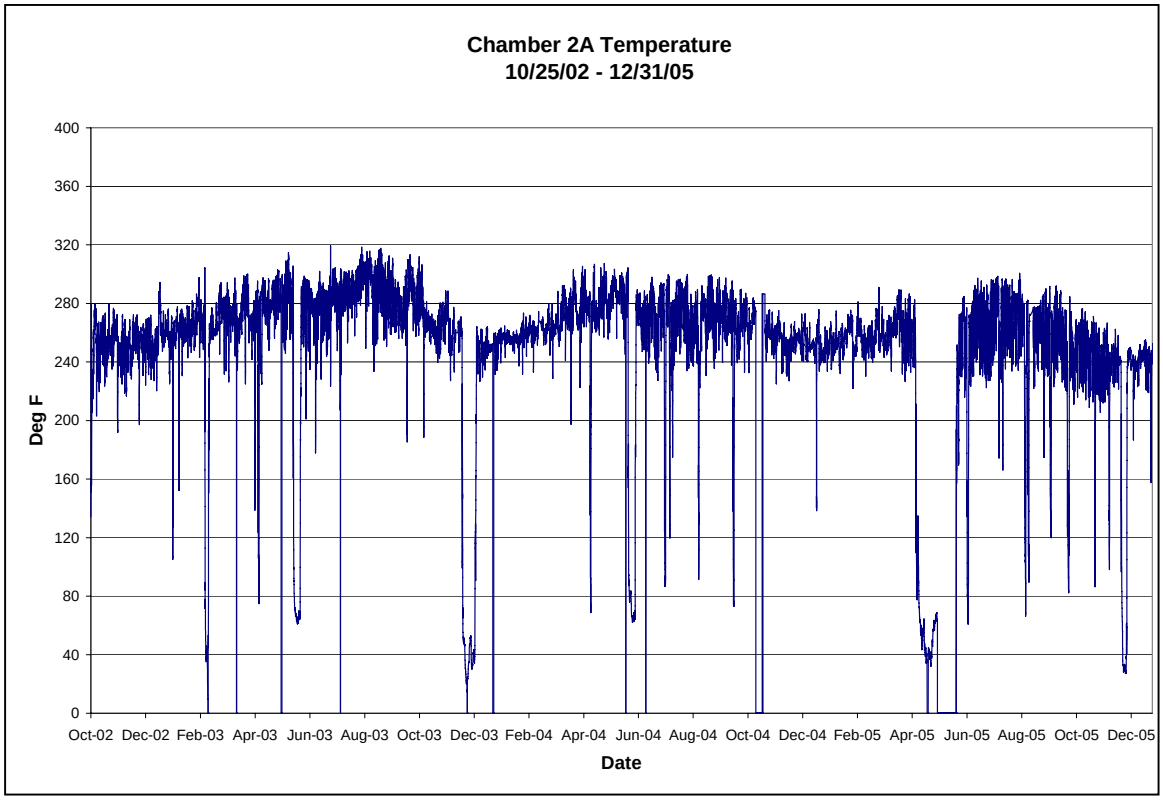

Opacity
10/25/02 - 12/31/05
%
0
2
4
6
8
10
12
14
16
18
20
Oct-02 Dec-02 Feb-03 Apr-03 Jun-03 Aug-03 Oct-03 Dec-03 Feb-04 Apr-04 Jun-04 Aug-04 Oct-04 Dec-04 Feb-05 Apr-05 Jun-05 Aug-05 Oct-05 Dec-05
Date

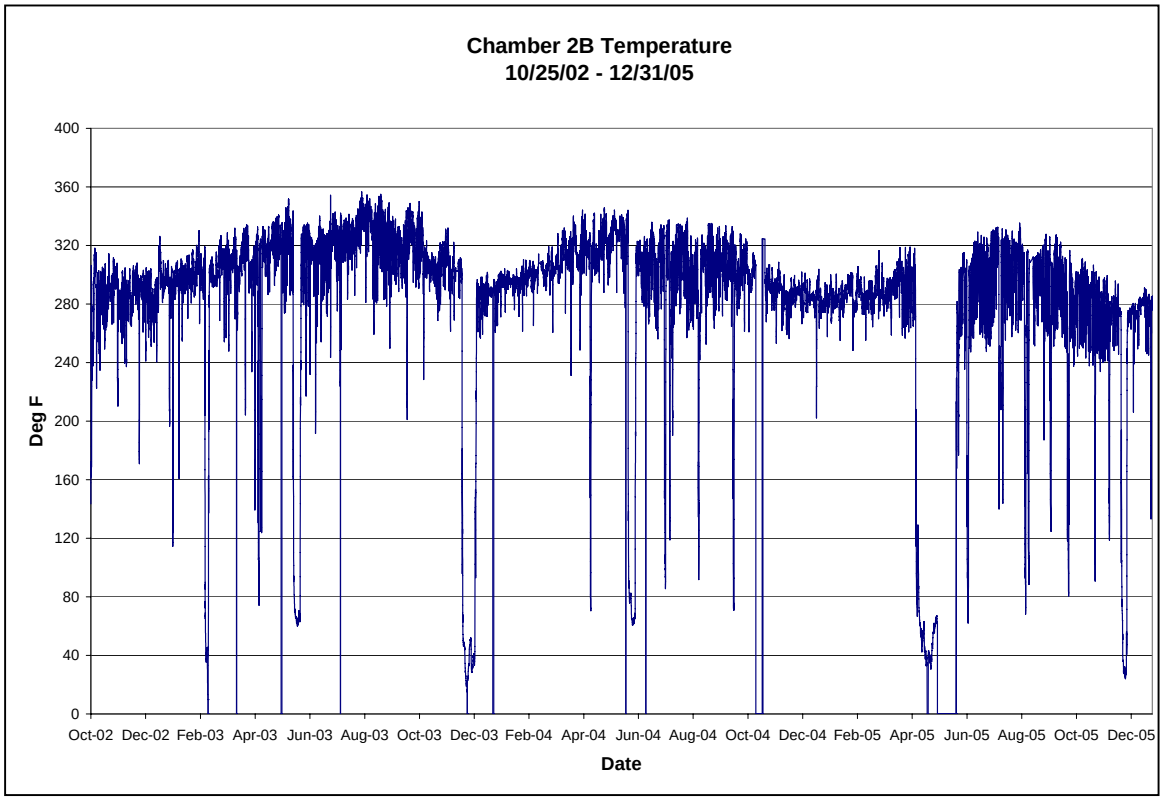

Outlet Gas Temperature
10/25/02 - 12/31/05
Deg F
480
440
400
360
320
280
240
200
160
120
80
40
0
Oct-02 Dec-02 Feb-03 Apr-03 Jun-03 Aug-03 Oct-03 Dec-03 Feb-04 Apr-04 Jun-04 Aug-04 Oct-04 Dec-04 Feb-05 Apr-05 Jun-05 Aug-05 Oct-05 Dec-05
Date

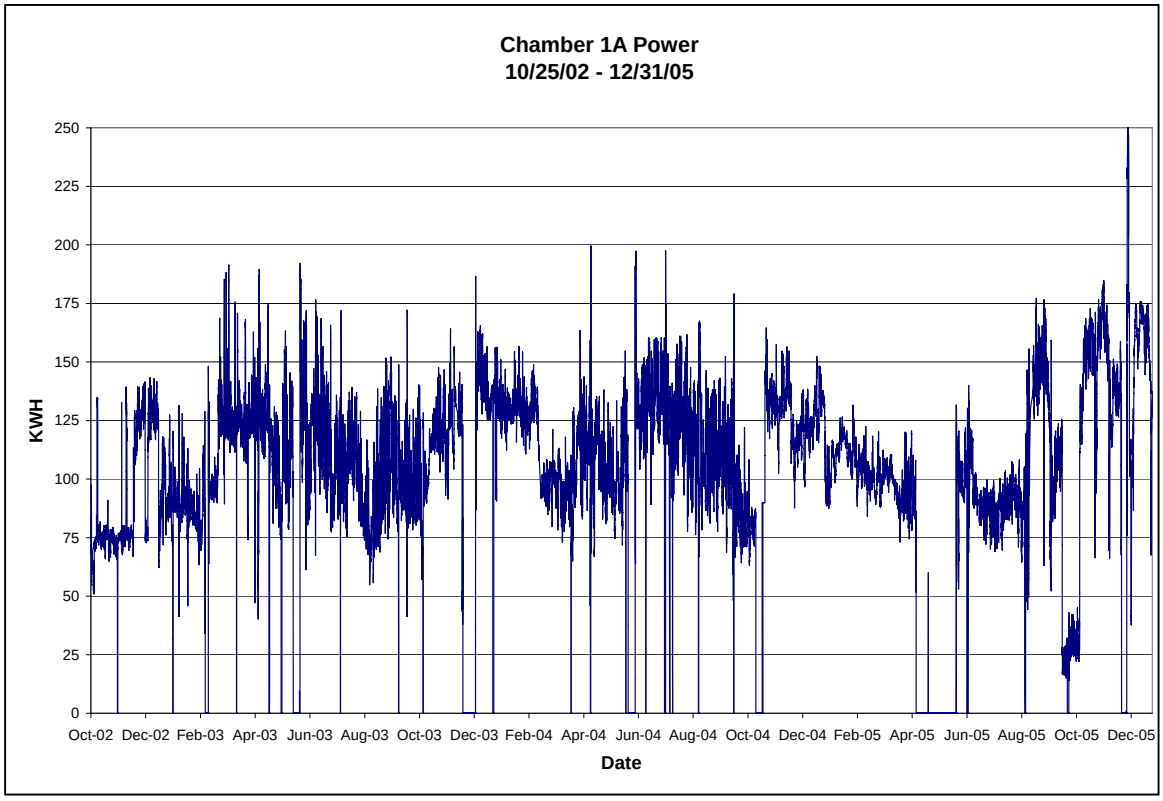

Outlet Pressure
10/25/02 - 12/31/05
IN H2O
0
-2
-4
-6
-8
-10
-12
-14
-16
-18
-20
-22
-24
-26
-28
-30
Oct-02 Dec-02 Feb-03 Apr-03 Jun-03 Aug-03 Oct-03 Dec-03 Feb-04 Apr-04 Jun-04 Aug-04 Oct-04 Dec-04 Feb-05 Apr-05 Jun-05 Aug-05 Oct-05 Dec-05
Date

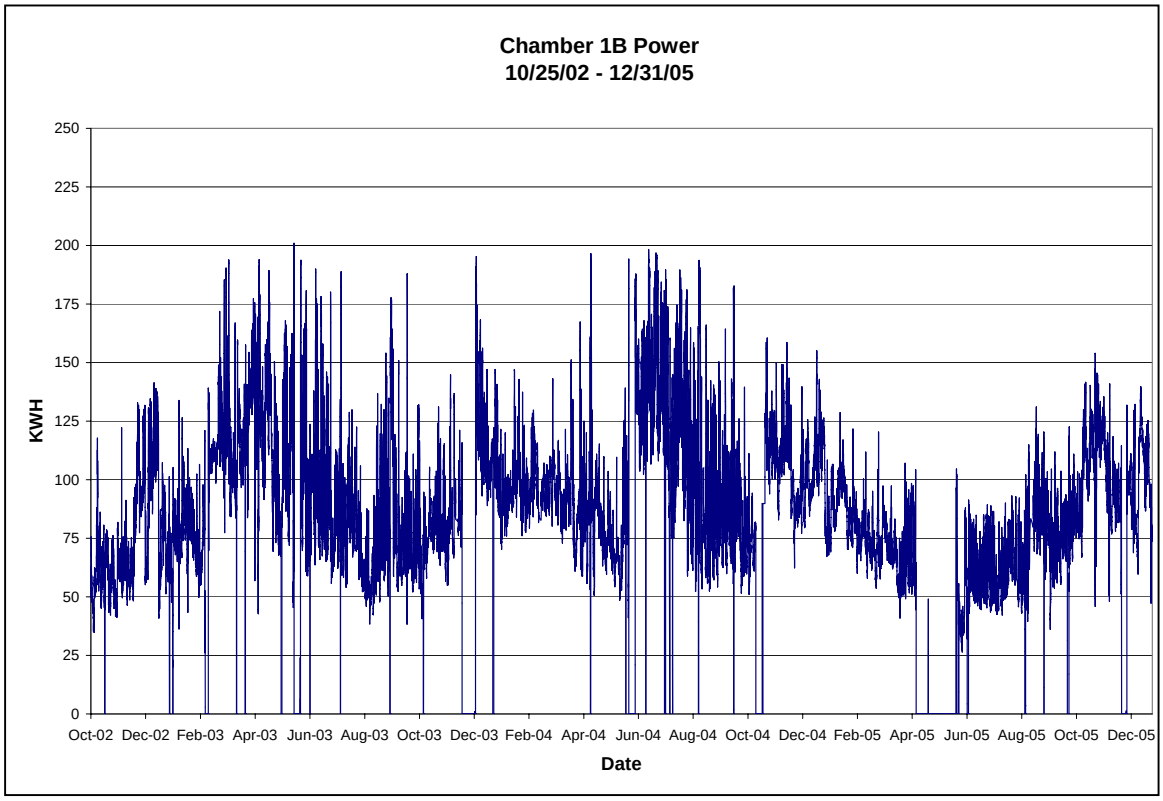

Chamber 1A Temperature
10/25/02 - 12/31/05
Deg F
400
360
320
280
240
200
160
120
80
40
0
Oct-02 Dec-02 Feb-03 Apr-03 Jun-03 Aug-03 Oct-03 Dec-03 Feb-04 Apr-04 Jun-04 Aug-04 Oct-04 Dec-04 Feb-05 Apr-05 Jun-05 Aug-05 Oct-05 Dec-05
Date

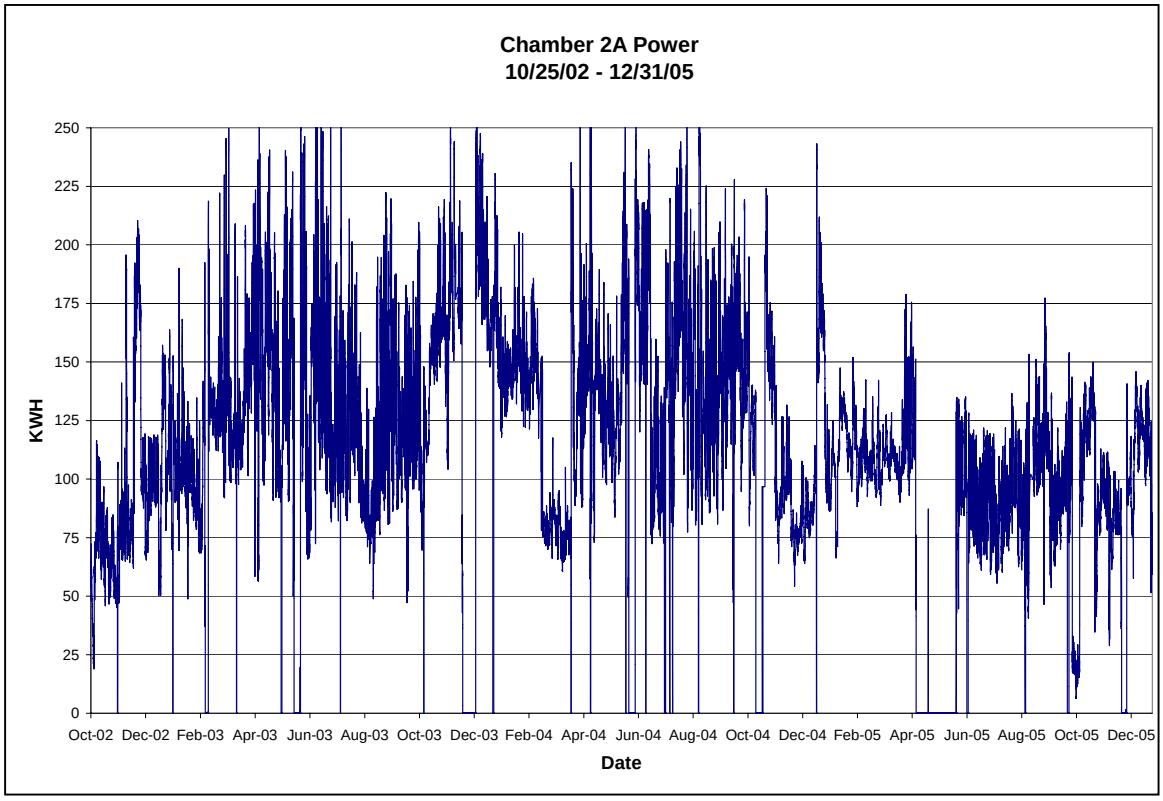

Chamber 1B Temperature
10/25/02 - 12/31/05
Deg F
400
360
320
280
240
200
160
120
80
40
0
Oct-02 Dec-02 Feb-03 Apr-03 Jun-03 Aug-03 Oct-03 Dec-03 Feb-04 Apr-04 Jun-04 Aug-04 Oct-04 Dec-04 Feb-05 Apr-05 Jun-05 Aug-05 Oct-05 Dec-05
Date

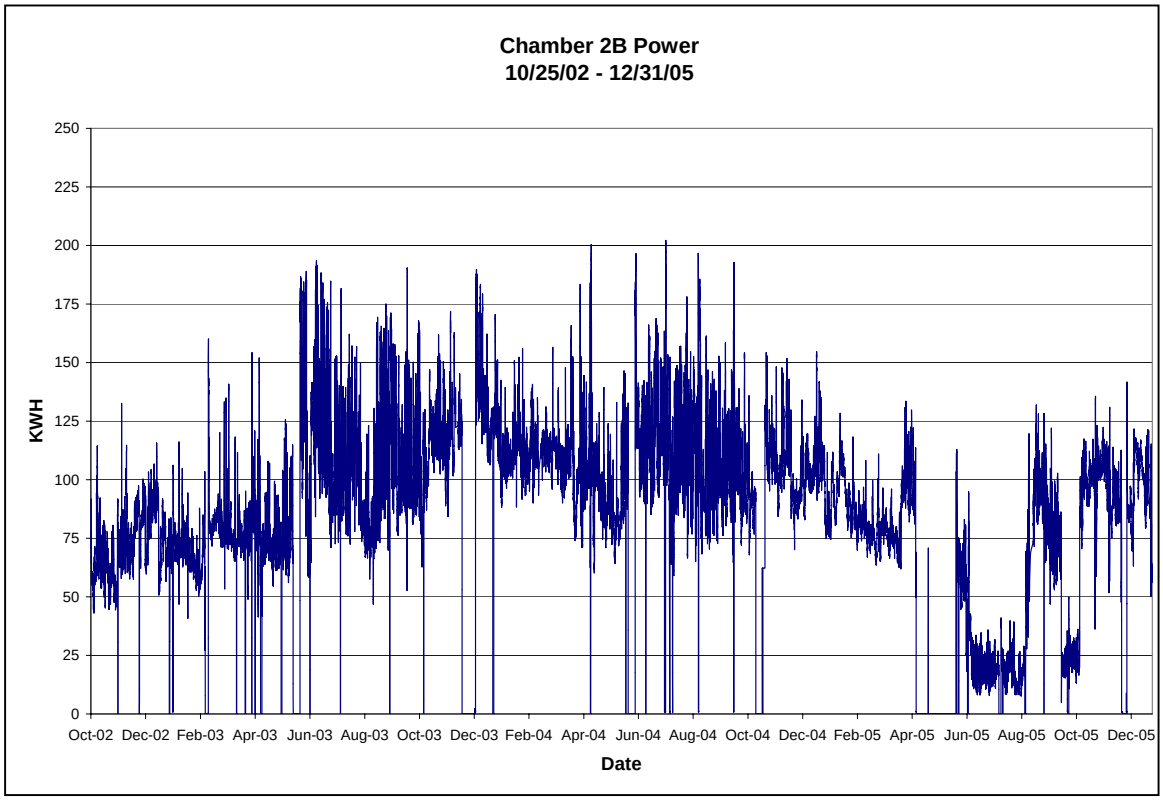

Chamber 2A Temperature
10/25/02 - 12/31/05
Deg F
400
360
320
280
240
200
160
120
80
40
0
Oct-02 Dec-02 Feb-03 Apr-03 Jun-03 Aug-03 Oct-03 Dec-03 Feb-04 Apr-04 Jun-04 Aug-04 Oct-04 Dec-04 Feb-05 Apr-05 Jun-05 Aug-05 Oct-05 Dec-05
Date

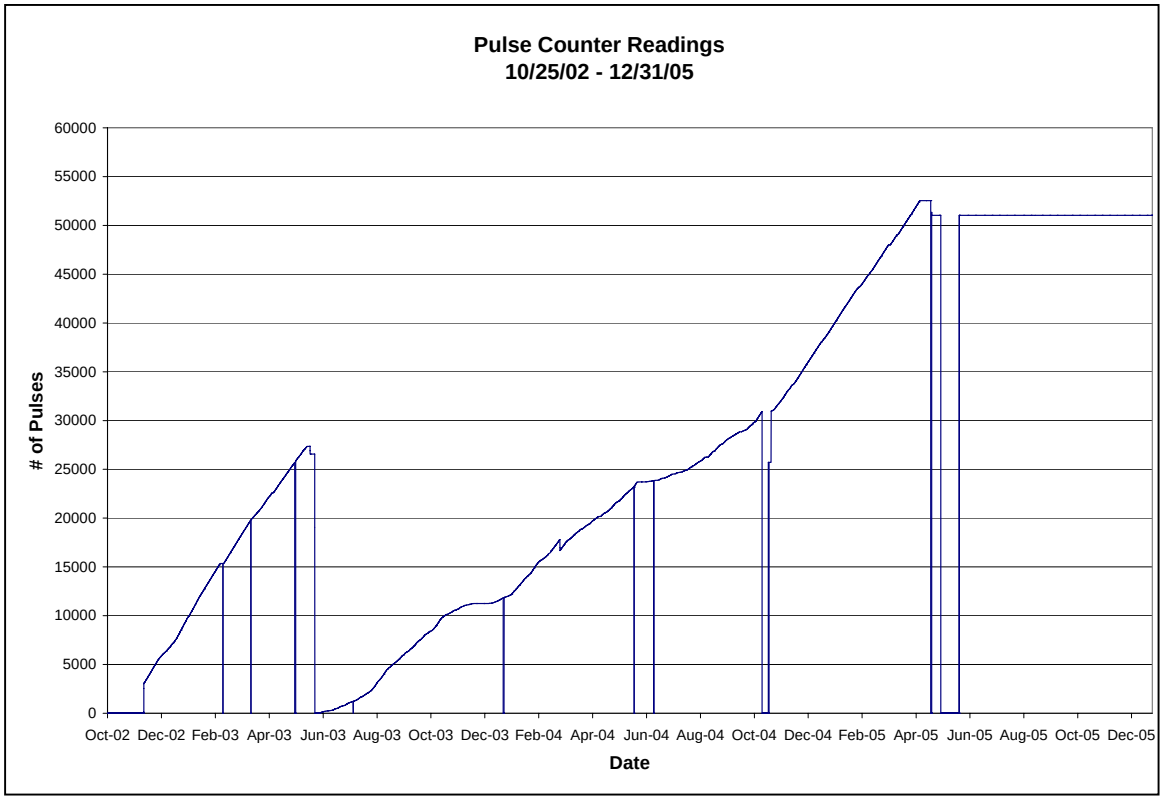

Chamber 2B Temperature
10/25/02 - 12/31/05
Deg F
400
360
320
280
240
200
160
120
80
40
0
Oct-02 Dec-02 Feb-03 Apr-03 Jun-03 Aug-03 Oct-03 Dec-03 Feb-04 Apr-04 Jun-04 Aug-04 Oct-04 Dec-04 Feb-05 Apr-05 Jun-05 Aug-05 Oct-05 Dec-05
Date

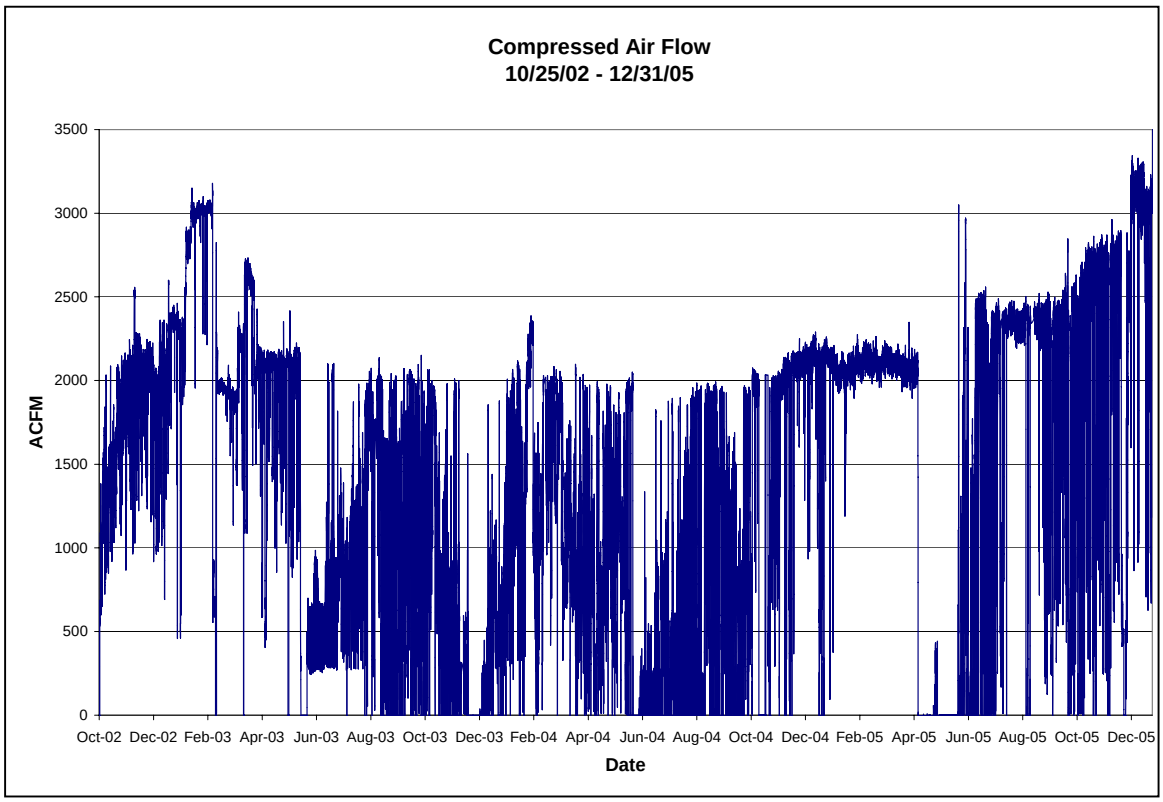

Chamber 1A Power
10/25/02 - 12/31/05
KWH
250
225
200
175
150
125
100
75
50
25
0
Oct-02 Dec-02 Feb-03 Apr-03 Jun-03 Aug-03 Oct-03 Dec-03 Feb-04 Apr-04 Jun-04 Aug-04 Oct-04 Dec-04 Feb-05 Apr-05 Jun-05 Aug-05 Oct-05 Dec-05
Date

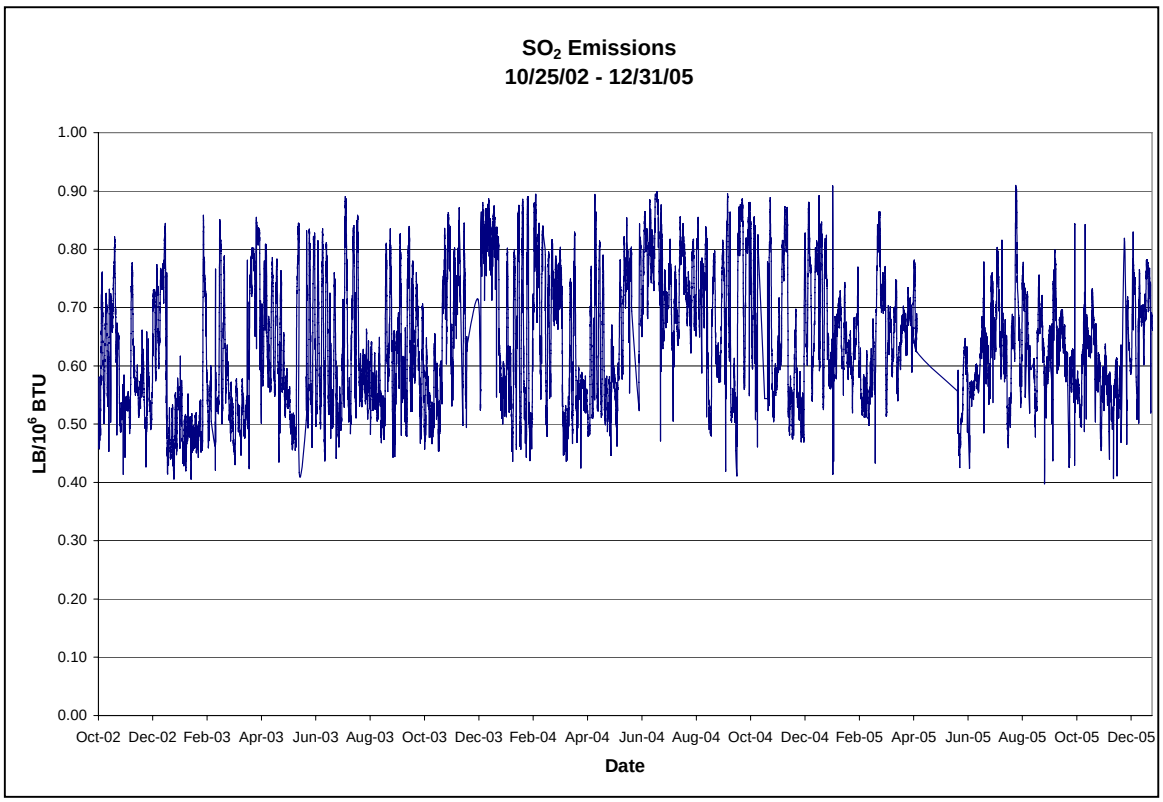

Chamber 1B Power
10/25/02 - 12/31/05
KWH
250
225
200
175
150
125
100
75
50
25
0
Oct-02 Dec-02 Feb-03 Apr-03 Jun-03 Aug-03 Oct-03 Dec-03 Feb-04 Apr-04 Jun-04 Aug-04 Oct-04 Dec-04 Feb-05 Apr-05 Jun-05 Aug-05 Oct-05 Dec-05
Date

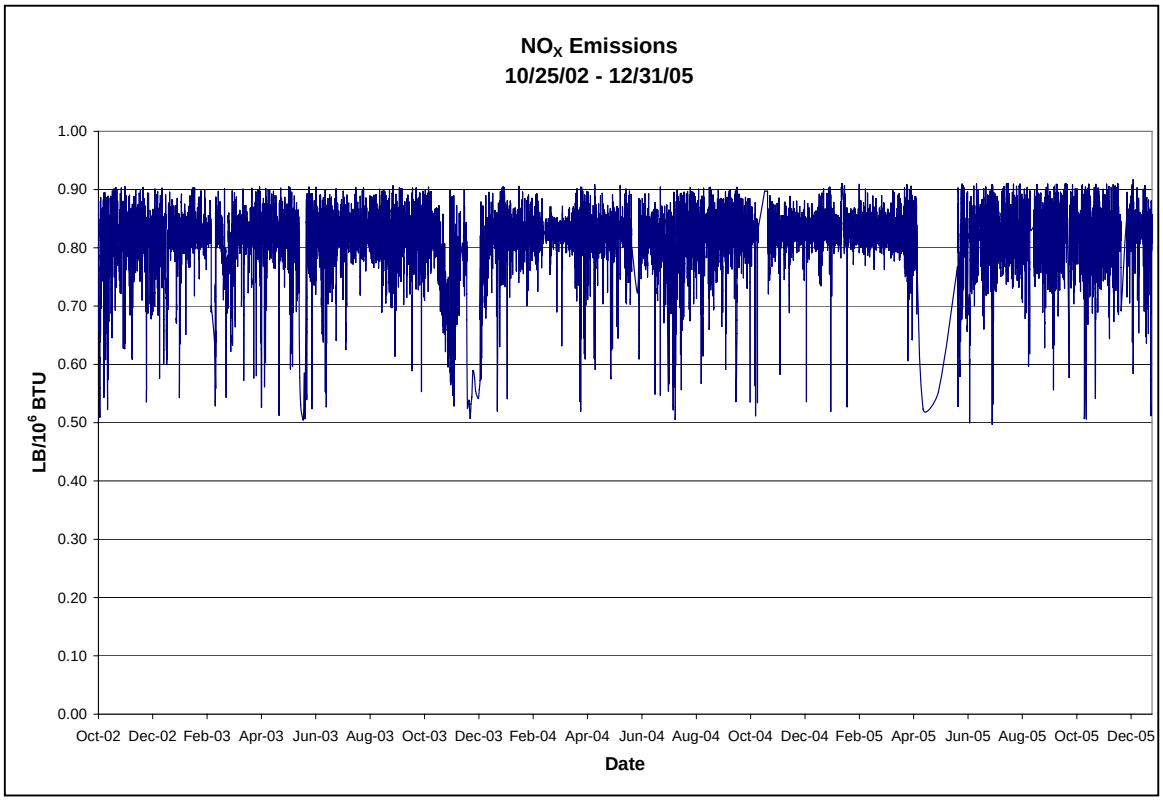

Chamber 2A Power
10/25/02 - 12/31/05
KWH
250
225
200
175
150
125
100
75
50
25
0
Oct-02 Dec-02 Feb-03 Apr-03 Jun-03 Aug-03 Oct-03 Dec-03 Feb-04 Apr-04 Jun-04 Aug-04 Oct-04 Dec-04 Feb-05 Apr-05 Jun-05 Aug-05 Oct-05 Dec-05
Date


Chamber 2B Power
10/25/02 - 12/31/05
KWH
250
225
200
175
150
125
100
75
50
25
0
Oct-02 Dec-02 Feb-03 Apr-03 Jun-03 Aug-03 Oct-03 Dec-03 Feb-04 Apr-04 Jun-04 Aug-04 Oct-04 Dec-04 Feb-05 Apr-05 Jun-05 Aug-05 Oct-05 Dec-05
Date


Pulse Counter Readings
10/25/02 - 12/31/05
# of Pulses
60000
55000
50000
45000
40000
35000
30000
25000
20000
15000
10000
5000
0
Oct-02 Dec-02 Feb-03 Apr-03 Jun-03 Aug-03 Oct-03 Dec-03 Feb-04 Apr-04 Jun-04 Aug-04 Oct-04 Dec-04 Feb-05 Apr-05 Jun-05 Aug-05 Oct-05 Dec-05
Date


Compressed Air Flow
10/25/02 - 12/31/05
ACFM
3500
3000
2500
2000
1500
1000
500
0
Oct-02 Dec-02 Feb-03 Apr-03 Jun-03 Aug-03 Oct-03 Dec-03 Feb-04 Apr-04 Jun-04 Aug-04 Oct-04 Dec-04 Feb-05 Apr-05 Jun-05 Aug-05 Oct-05 Dec-05
Date


SO2 Emissions
10/25/02 - 12/31/05
LB/10^6 BTU
1.00
0.90
0.80
0.70
0.60
0.50
0.40
0.30
0.20
0.10
0.00
Oct-02 Dec-02 Feb-03 Apr-03 Jun-03 Aug-03 Oct-03 Dec-03 Feb-04 Apr-04 Jun-04 Aug-04 Oct-04 Dec-04 Feb-05 Apr-05 Jun-05 Aug-05 Oct-05 Dec-05
Date


NOX Emissions
10/25/02 - 12/31/05
LB/10^6 BTU
1.00
0.90
0.80
0.70
0.60
0.50
0.40
0.30
0.20
0.10
0.00
Oct-02 Dec-02 Feb-03 Apr-03 Jun-03 Aug-03 Oct-03 Dec-03 Feb-04 Apr-04 Jun-04 Aug-04 Oct-04 Dec-04 Feb-05 Apr-05 Jun-05 Aug-05 Oct-05 Dec-05
Date